The Mining And Metallurgical Journal

VOL. XXI. NO. 9 LOS ANGELES, CAL., August 1, 1899, NEW YORK, N. Y. Price 15 Cents

ALPHABETICAL INDEX TO ADVERTISERS

The Mining and Metallurgical Journal

ENTERED AT THE POST OFFICE AT LOS ANGELES, CALIFORNIA AS SECOND CLASS MAIL MATTER.

VOL. XXI. AUGUST 1, 1899. No. 9

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SUBSCRIPTION PRICE:
For United States, Mexico and Canada..... $2.50 per annum
" " " " " ..... 1.25 six months
All other countries in the postal union..... 3.50 per annum
" " " " " ..... 1.75 six months

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WATER STORAGE AND FORESTRY.

The meetings of the American Forestry Association were held in Los Angeles, Cal., on 19th and 20th July last, Abbott Kinney presided along with Secretaries George W. Whittlesey and W. H. Knight.

Among the delegates present according to the registration of names were these: Lucius A. Booth, Oakland; W. Fordice Jones, Temple, Tex.; Charles A. Keffer, Mesilla Park, N. M.; Samuel B. Green, University of Minnesota, Minneapolis; George W. Whittlesey, Washington; William S. Lyon, Los Angeles; A. J. McClatchie, University of Arizona; W. W. Everett, San Francisco; Chas. H. Shinn, Berkeley; Clarence L. Cory, Berkeley; W. S. Melick, Pasadena; F. H. Newell, Washington; Charles C. Swisher, Washington; Gifford Pinchot, Washington; Adolph Wood, San Bernardino; Nathan W. Blanchard, Santa Paula; George H. Maxwell, San Francisco; H. A. Barclay, Los Angeles; C. H. Van Epps, Whitier; William N. Campbell, Pasadena; O. S. Breese, Los Angeles; James Boyd, Riverside; Thomas G. Lawson, Los Angeles; J. A. Lippincott, Philadelphia; J. B. Lippincott, Los Angeles; M. M. Ross, Nashville, Tenn.; Harvey C. Stiles, Redlands; C. G. Baldwin, Claremont; C. A. Colemore, Santa Monica; George H. Peck, El Monte; Fred L. Alles, Los Angeles; H. W. Duncan, W. F. Burbank, A. R. Sprague, T. S. Van Dyke, C. M. Heintz, Los Angeles; S. M. Woodbury, South Pasadena.

The meeting on Wednesday evening, 19th July, was somewhat changed from what had been intended by the committee. The illustrated lecture of F. H. Newell was postponed until the next evening, to allow Gifford Pinchot, who desired to leave the city Thursday evening, to present his illustrated lecture. J. B. Lippincott concluded the session with an illustrated lecture on "The Bitter Root Range of Montana."

Gov. H. T. Gage, Senator Stephen M. White and Congressman R. J. Waters were not in attendance, having been detained elsewhere on business. Assemblyman W. S. Melick, of Pasadena, was the first to address the convention.

At the session of the forenoon on Thursday, the address of Hon. Elwood Cooper was omitted, because of his absence, and the paper of A. Campbell-Johnson, on "A Forest Experiment Station," was read by Secretary Whittlesey, of the American Association. The author of this paper urged the establishment of experimental stations and a systematic planting of trees.

H. Hawgood, the well known civil engineer, followed with a paper, entitled "Engineering Problems in Forestry and Water Storage."

The paper of S. H. Woodbridge, Ph. D., on "Water Conservation in Soils, followed." The speaker related the result of his own experiments to show that some varieties of soil absorb moisture much more rapidly than others, and the natural mould of an old forest is the best in every respect, being naturally more moist and consequently more ready to take in by capilary attraction the rain that falls upon it. The object of the paper, like that of the one that preceded it, was to show the absolute necessity of preserving the forests that protect the absorbent soil which serves such useful purpose in storing water for the use of man.

Elwood Mead, formerly state engineer of Wyoming, recently appointed irrigation expert for the department of agriculture at Washington, delivered an excellent paper on "The Future Policy for Irrigation in the West." He prefaced his remarks by saying that he had intended making his address applicable to local conditions here, but he finds that he can do that only after making a personal investigation. Conditions that apply to other regions could not be adapted to the needs of this country, and on this subject he will be more specific at some future time.

The tenor of his address was an unqualified indorsement of a proposal to lease for grazing purposes all the public lands, and to use the money thus obtained in the construction of storage reservoirs and irrigating canals. He argued that in regions where high freight rates prevail and production is scanty, it is folly to expect private enterprise to engage in great works of storage reservoirs and irrigation systems. For the state to undertake it a way must be found to raise the money. Taxation would be objectionable. The necessary money could be raised by leasing the public lands—a proposition that would be objected to by no person, not even those that would be the tenants. In some arid states, Mr. Mead said, the income that would be derived from the rental of the public lands for grazing purposes would far exceed the total taxation. The receipts from the rental could be utilized in the building of the needed storage reservoirs and systems of canals, and no additional burden would be put upon the people.

Because of the lack of a rental system the occupants of public lands feel that they have no tenure of possession. They will not even plant a tree or dig a ditch. They hold the land for what they can get off of it, expecting to move as soon as the last vestige of sustenance has disappeared from it. Under a rental system, the speaker said, all this would be changed, and there would be an income that could be converted to the public good.

Wallace W. Everett, associate editor of *Wood and Iron*, a San Francisco publication, next presented a paper on "The Practical in Forestry." It was an exposition of the subject viewed from the money-making standpoint of the sawmill men, against whose inroads the forestry association is now doing battle. It seemed like a discordant note sounded in the harmony of the meeting, but it was an able paper on the subject. Mr. Everett, voicing the sawmill interests, frankly admitted that the lumber men are opposed to the policy of the association which hopes to save the mountain forests. The speaker made some suggestions as to how the association should proceed. The address was listened to with attention.

The concluding paper of the morning session was by O. S. Breese, of THE MINING AND METALLURGICAL JOURNAL, on the relation of the mining industry to the preservation of forests.

The most interesting part of the afternoon session was the consideration of those questions that are of strictly local application, by F. H. Olmstead, Los Angeles, City Engineer, and Mayor Fred Eaton, formerly City Engineer. These speeches were, however, prefaced by three others of a general nature.

Superintendent John McClaren, of the San Francisco city parks, spoke on the "Reclamation of the Drifting Sand Dunes in Golden Gate Park." The speaker explained the methods that had been employed to prevent the constant shifting of the sand dunes.

W. R. Dudley, professor of botany in Stanford University, spoke at length on "The Sequoia of the Sierra and their Distribution."

James D. Schuyler, consulting hydraulic engineer, spoke on "Storage Reservoirs as Affected by Forests."

Chairman Kinney here introduced F. H. Olmstead, City Engineer, who, with a large map of the country surrounding Los Angeles, showing the source of the Los Angeles River, spoke on "Forest Preservation and the watershed of the Los Angeles River."

T. S. Van Dyke spoke on "Irrigation Problems."

After reviewing at length the experience of land owners and co-operative associations in running irrigation systems, Mr. Van Dyke concluded by expressing his entire approval of the system proposed by Elwood Mead.

A paper on "The Forestry School of the University of Southern California," by George W. White, president of the institution, was read by Prof. Laird J. Stabler, and the exercises of the afternoon closed with an address on "Forestry in North Dakota" by W. W. Barrett, vice president of the association from that state.

The closing hours of the convention were occupied with some of the most interesting speeches of the day. The attendance was larger than at the previous sessions, and the audience seemed to take a great interest in what the speakers had to say.

F. H. Newell, Hydrographer of the United States Geological Survey, gave an illustrated lecture showing the conditions of our forests, and replete with views explanatory of dams and irrigation works.

Hon. George H. Maxwell of San Francisco, executive chairman of the National Irrigation Association, was the next speaker. He discussed "Nature's Storage Reservoir."

Abbot Kinney closed the speech-making with an address on "The Forest Problem in the West."

At the conclusion of the speech the Committee on Resolutions presented its report, and resolutions were adopted.

Numerous amusements had been arranged to entertain the delegates in Southern California.

MINERS' ASSOCIATIONS.

The value of Miners' Associations in protecting the interests of the industry has already been felt in the short period of eight years' existence of the California Miners' Association. The influence for good has been extended to the southern counties of California by the formation of the Southern California Branch with a membership that increases monthly as the objects and usefulness of union in a common cause become known. By invitation from this Association the seventy-seventh meeting of the American Institute of Mining Engineers will begin on the 25th of September next in San Francisco, after which the regular annual meeting of the California Miners' Association will be held. It is the privilege and duty of all who are interested in mining to become identified with this Association and benefit by these meetings and aid the proper representation of the importance of mining in Southern California. One of the objects of miners' associations is to propose and regulate legislative and other measures affecting the mining laws and industry. As there are a small class of well meaning but inexperienced enthusiasts who desire to make a change in our just mining law which allows the miner to follow the dip or pitch of his vein or deposit under the side lines of his claim when it dips at an angle from the vertical, to the square location with vertical side line boundaries, which would be an unjust law to capital and labor invested in almost all the mining districts of California, it is the duty of mine owners to cast their influence against such an unjust, ill advised and backward step by joining the California Miners' Association and defend their own interests. Such a change in our laws would put a restriction and limit on deep mining by giving to another party the continuation of your vein in depth when it passed under the side line of your claim. It is an eastern State or farmer's boundary, and is suitable for surface conditions but not for underground or mining operations as it does not restrict or stop the theft or appropriation of ore, but gives the result of your labor and discovery to another. The chief contention of such parties who desire to change the present law is that it is productive of litigation, but they do not stop to consider that the error lies not in our mining law, but in our wrong manner of settling disputes among miners in courts of law by lawyers whose interest it is to carry on the fight for all there is in it. The settlement of any disputes arising out of mining can best be made by arbitrators who are mining men by visiting the ground and taking the evidence on the spot. In the early days of California that was the manner adopted of settling mining disputes and consequently long and expensive litigation was unknown until miners resorted to the courts of law and lawyers to obtain justice. For these and other equally good reasons every miner and prospector should give his influence in defending his interests by becoming a member of the California Miners' Association.

FUEL SUPPLY OF THE PACIFIC SLOPE.

The local coal supply of the Pacific Coast is derived from the soft, inferior lignites of cretaceous age, and amounts to so little that it can hardly be considered a competitor with that imported by sea from foreign ports or by rail from New Mexico. It is not produced in sufficient amount to be classed as a competitor with foreign coal or with the local supply of asphaltum base crude oil for manufacturing purposes. On account of the small area of these local coal fields and the small width of the beds of it found therein, there is no hope of future discoveries of large supplies*. The local fuel oil, which has great heating power, is a much more important factor in competition with coal imported by rail or by the sea. The present market value of this oil has recently increased to $1.25 per barrel on account of the advance in the price of iron and steel, which is used for oil well casing. Three barrels of oil are considered equal to one ton of coal for steam purposes. For household purposes the imported coal from British Columbia, Australia and England has been the chief source of supply. For these reasons the Pacific Coast of North and South America presents a new market for the bituminous and anthracite coal of the Eastern States when these States awake to the necessity of fighting the railroad monopoly which controls legislation in opposing and preventing the speedy construction of the Nicaragua Canal. The coal trade of the East is only one branch of United States commerce that is shut off from part of their own territory and in doing an export business on the Pacific by the railroad monopoly. With the construction of the inter-oceanic canal vessels would bring out Eastern coal and manufactured articles and take back lumber, minerals, fruit and grain to the East. Eastern enterprise is as much interested in this worthy project as are the Pacific Coast States.

*We will watch the development of the coal beds at Garlock, Kern county, Cal., with interest.

AN ERA OF STRIKES.

The country has been, and still is, passing through a series of strikes, unusual in number and in stubborn pertinacity. There are constant mutations in business conditions, and, consequently, the relations in some aspects of labor and capital are as constantly changing. The real struggle is for a deserved share of produced wealth on the part of labor.

There are repeated asseverations of prosperity in the country, and the prices of some commodities have greatly advanced, and with no increase in the cost of production, the profits to capital have been greatly enhanced. Seeing this has caused the operatives to believe that their wages should be correspondingly raised, and because this has not been done, and is refused, strikes are resorted to for the enforcement of compliance with the terms of the workers. The antagonism between labor and capital is the same as that between buyer and seller, or producer and consumer. The selfishness of human nature often interposes obstacles to relations of fairness and justice which should ever exist between the various classes of humanity.

It is unfortunate that there cannot always be an understanding, based upon what each deserves in the allotment of wealth as it is produced. There are two reasons why this is not done, one being too much egoism, and the other is the want of knowledge of conditions which should be taken into consideration in awarding the just share to each.

Capital does not of itself produce wealth, but it is a useful and necessary agency in carrying forward enterprises and industries by which opportunities are afforded for producing wealth in conjunction with labor. The possessors of capital thus invested are entitled to be guaranteed not only against loss, but to a just and reasonable remuneration, which should at least be sufficient to compensate for the trouble and hazards of making the investment, and more than that, as capital may be regarded as so much stored labor, it should have an earning power, that the aged may have the means of livelihood when their earning power has departed from them.

Labor should not be deprived of its fair share of produced wealth, and there would be no collision between the forces of labor and capital, if there were a disposition on both sides to act justly, and the intelligence to comprehend the inevitable ups and downs in business affairs.

Capitalists should not make a cast iron rule as to the profits they will exact, nor should labor make an unchangeable scale of wages. There should be a sliding scale on both sides, and equitable changes made to correspond with the varying conditions of business.

The right to refuse to work when terms are unsatisfactory is undeniable, but dissatisfaction should rest upon substantial grounds, and not upon an inadequate knowledge of existing facts. Strikes that proceed no farther than cessation from work no one should find fault with, except those who suffer from the non-earning of wages, but those which are attended by destruction of property, or interference with those who are willing to work on proferred terms, are more than reprehensible, they are crimes against society. The principle is the same whether property is wrongly taken from one or he is wrongfully prevented from earning property. Labor organizations should guard against the undue exactions of capital, but because among laboring men there are non communicants with labor organizations, it is no excuse for a resort to coersion and violence.

The indefensible conduct of strikers in the past has kept a large number of thoughtful and good men from becoming members of labor organizations. A just course will largely increase the membership, and create a more extended and deeper sympathy on the part of the American people. Reprehensible demands and incendiary agitation estrange sympathy and impair the effect of organized effort to protect the rights and promote the interests of the working classes. Labor and capital are interdependent, and should be cordially co-operative.

These are some of the general principles that should be respected. The issues in specific cases it is not our purpose or business to discuss.

THE PNEUMATIC CYANIDE PROCESS.

The claims made to invention and patent by certain Denver, Colorado, parties, represented by Jean Webb as the inventor of the improvement in operating a cyanide plant in obtaining or increasing the required supply of oxygen from the atmosphere by the introduction of compressed air into the vats is not new, as can be easily proven. The use of air for this purpose has been practiced by Messrs. Dean and Brand at their mill near Kane Springs in the Randsburg district, California, for about four years. Messrs. Porter and Llewellan at Garlock used the same appliance and it has been in use in other mills in California for the same time, so that it is not a new invention as claimed by the would-be patentee. The supply of air was obtained by Messrs. Dean and Brand from a small air

compressor which they added to their plant as an experiment, which proved a success, as the mechanical action of the air circulating through the solution aided the chemical production of cyanogen, as well as the solution of the gold in the ore by keeping it agitated at no extra expense, except for the first cost of the compressor and fittings. These operations were not conducted on the laboratory amount of a ten pound sample, as the Colorado experiments have been, but were in daily use in large vats holding several tons of ore. As it is several years since the writer obtained this information from Messrs. Dean and Brand, the exact capacity of the plant cannot be given correctly.

CORRESPONDENCE

IDAHO.

Boisé, Idaho, July 8, 1899.

Here is a very pretty little town of some seven to nine thousand population, resting against the foothills of the mountains that bound the Snake River Valley on the north. It is 20 miles off the route of the railroad, and few transcontinental travelers know of its existence; but those who do make the the side trip on the stub railroad running from Nampa on the main line, and who stay long enough to learn something of the place and the surroundings, do not consider the time lost. Just at the city the Boisé river emerges between black, lava-capped buttes from the mountains, and after flowing westward fifty miles through a very fertile valley, empties into the Snake.

No one seems to know exactly when the first French voyageurs or Jesuit Fathers arrived from the north at the mouth of this fine stream, and attracted by its clear water and the wealth of timber fringing the banks and covering its bottoms—presenting such a contrast to the majority of water courses in Southern Idaho—called it the "Riviere Boisé, or Wooded Stream. But, as early as 1830 at least, and probably years before, the Hudson Bay Company had a small trading post at its mouth. In 1803, when what is now called the Pacific northwest, by being a part of the Louisiana Purchase, passed from the sovereignty of France to that of the United States, the government seems to have established a little military post at or very near the site of the older fort, which probably had for its main purpose the protection of emigrants who were traveling by the Snake River route to the Pacific ocean.

In 1860, the overflow of miners and prospectors from California and Oregon poured over into Idaho and made the first discovery of gold within its present borders on one of the branches of the Clearwater, about 200 miles north of Fort Boisé. During 1861 and 1862, the miners rapidly worked their way southward through the mountains until, in the fall of the latter year, the wonderful placer deposits of the Boisé Basin were discovered. This caused such a rush into Southern Idaho that the government moved its small post at the mouth of the river up to the base of the hills from which the Boisé river emerges, and that incident determined the location of the town. It became at once of course the supply point for the newly-discovered gold mines.

Situated on a gentle, sloping plain between the river and the hills, where the soil is rich and deep from the disintegration of the lava-capped ridges close by; abundantly supplied with water for irrigation; provided with plenty of business in furnishing supplies to the army post and the miners, the little town prospered from the start; but like all individuals and communities who make money too easily and too early in life, soon lost energy and push, became indifferent of the future under the belief that it was a favorite of fortune; acquired a tremendously swelled head when it was chosen the capital of the State, and lost its senses completely. So when the railroad in 1884 came along through the Snake Valley, and the citizens were asked what they would do for it in the way of depot facilities and rights of way, the self-satisfied property-holders, believing that the railroad had to come to them, looked important and said they had land to sell if the company's pile was large enough — if not, they were sorry, etc., etc. Thereupon the representative of the company shook the dust of the town from his feet, and went and located his line 15 miles south over a low ridge and passed on to the Pacific. Since which time the live citizens of the place have been repenting in dust and ashes, while the rest are hoping to live till the day when some new transcontinental line will come along this way and give them another chance.

The Boisé cemetery, however, shows healthy signs of growth of late. There are indications that the old town is acquiring its second wind. A new set of men are coming in and seizing control of its business. There is a decided revival of mining in the Basin (of which more anon) and of railroad talk in the hotel lobbies. A single car does duty on the electric tramway line running from one end of the city to the other. Cement sidewalks are being laid in many places. The town itself is really such a pretty one, and so deeply embowered in trees, that but little in the way of cement improvement is needed to make a showing. Of course it has an electric light and power plant, and a telephone exchange, and the latter extends up into the Basin and across the Snake Valley to the Owyhee Mountains, where there are great quartz mining interests, and is also connected with the general telephone system building eastward from the Pacific Coast. Boisé can already talk with Los Angeles, San Francisco, Portland, Seattle, Spokane and Helena; and before the year is out will be in connection with Salt Lake.

The Boise Valley appears to be better adapted to fruit raising than to any other branch of agriculture, and of the fruits, the countryside seems to have become more violently addicted to prunes than to anything else. At any rate, the largest prune orchard in the United States—and perhaps in the world—is a few miles below the town. Idaho prunes are thought to be fully equal if not superior to any raised, and evidences are not lacking that many thousand pounds of them each year masquerade successfully in the Eastern States under the brand of "Imported Turkish." Thus does home industry flourish at the expense of the effete European and in spite of the efforts of the Europeanized American.

Artesian hot water is the specialty of the place. Denver has its own and only snow-clad mountain range to boast of; San Francisco calls the seal rocks its especial attraction; Los Angeles the beautiful San Jacinto range and the ostrich farms; Salt Lake City points to its inland ocean bathing as its particular charm; Butte mentions copper as its monopoly; Boise in its turn is the one place in the Union where newer business blocks and residences are heated and supplied with natural hot water. The fluid was encountered 300 feet from the surface at a point about one and one half miles east of the town. It is utilized first in supplying what is by very long odds the finest natatorium on the continent, with a stone and cement plunge 60x120 feet, surrounded by a beautiful building containing all the concomitants of such an institution; and then the overflow, conducted in iron pipes to the heart of the town, is passed through all the finer recently erected buildings. The streets are sprinkled and washed with hot water, and it is all the year round—but particularly in summer—an unmixed blessing to laundrymen, housekeepers and hotels. Being quite free from mineral and quite hot (170° Fahr.) it finds its way through the community leaving no unpleasant trace or trail behind, a blessing to all. The only weak point in the institution so far seems to be that there is not as yet enough to go around. But in the new life that is coming to Boisé, new wells will be sunk, and more hot water developed. The source appears to be in a volcanic butte close to town, whose internals only need scientific and persistent probing to produce an unlimited, or at least, a greatly increased yield.

I am off for the Basin in a few days, and will shortly have some notes on that interesting region from which the gold has been pouring in a steady stream for the last thirty-six years. Theo. F. Van Wagenen.

PENNSYLVANIA.

Iron Castings Advance In Price.

At a special meeting of the jobbing foundries of Philadelphia and vicinity, at the Manufacturers' Club, under the auspices of the Foundrymen's Association, on Thursday evening, July 6, '99, the following was unanimously adopted:

Resolved: That, on account of "the rapid rise in price of pig iron, scrap iron, and other raw material, it is the sense of this meeting that the present price for iron castings is too low," therefore be it

Resolved: That "The price of iron castings be advanced ½c. to 1c. per pound, to take effect immediately."

Resolved: "That should there be a further rise in pig iron, scrap iron or raw material, that the price of iron castings shall be advanced at least in proportion."

Howard Evans, Sec'y.

The Mystic Rotary Quartz Crusher Co., composed of B. I. Turman and T. J. Hampton, sole owners of the Mystic Quartz Crusher, for crushing all kinds of ores, wet or dry, have issued a pamphlet descriptive of the machine. This crusher is built on entirely new lines, and a mill that will crush 20 tons in 24 hours, through a 30-mesh screen, costs $1,200. Ex-Governor H. H. Markham had one mill on his American Girl mine, at Hedges, in San Diego County, Cal., and has ordered another. For further particulars, address the main offices, 132 South Broadway, Los Angeles, Cal.

The American Diamond Rock Drill Co., of 120 Liberty Street, New York, report as among recent sales one diamond drill for South America, one for Canada, two for the Southern States, one for Pennsylvania, and two for Central America. The supply trade is also keeping the shops busy, and the outlook seems good for increased business.

TWO REPUBLIC MINES.

PRINCESS MAUDE.

The roughest kind of figuring upon the showing in the Princess Maude mine at present indicates that there is 40,000 tons of ore practically in sight and there is little reason to doubt that this will average $15 per ton. Certain it is that the average of the ore thus far encountered in the drift in which work is at present being prosecuted is better than $15 per ton. The ore chute on the Princess Maude is practically demonstrated to extend 480 feet through the claim. The present workings are at a depth of 262 feet. It is certainly safe to say that there is a round half million dollars' worth of ore in sight and it is more than probable that the actual value of the ore is nearer twice that sum.

A shaft on the Princess Maude ledge near the south end line of the claim is down 104 feet. In this is four and a half feet of quartz showing in the bottom. Assays of this made from samples taken in the presence of the correspondent of the *Spokesman-Review* last summer went over $30. There were indications that the shaft had struck on the edge of a pay chute, as the ore on the south side of the bottom of the shaft went about $18 and on the north side it went as high as $36. The showing was so satisfactory that it was decided to drive a tunnel to catch the ledge at a depth of 260 to 270 feet. About the time this was started a shaft was sunk on the Dude fraction, a narrow wedge of ground lying between the Princess Maude and the Jim Blaine. This shaft prospected the Princess Maude ledge to a depth of ten feet and showed ore which assayed as high as $18 across four feet of quartz. It was this showing which led the Jim Blaine company to start a tunnel which is now being run to catch the Princess Maude vein where it runs through the Dude fraction into the Jim Blaine and thence on into the Republic claim.

The distance between the shaft at the south end of the Princess Maude and the one on the Dude fraction near the east side line of the Princess Maude is about 480 feet. The development proved that chutes of pay ore existed in the ledge at both ends where it passed out of the claim. By many it was deemed the height of folly when the management started a tunnel to catch the ledge at a point about midway between the two shafts. It was argued that ore chutes are rarely over 200 feet long and that the ledge was almost sure to be encountered in a barren place.

The tunnel was started last October and the work was carried forward without a pause, three shifts being employed most of the time, until at a point of 407 feet in from the portal, the ledge was encountered. Those who had expected barrenness were surprised, and even the most sanguine were astonished when it was shown that the tunnel had encountered ore even richer than was shown in either of the shafts and with the ledge fully as strong as it had shown at any other point. Doubters were satisfied, and there is not a mining man in camp today, who knows his business, who does not regard the Princess Maude as one of the proved mines of the camp.

There is a favorable feature in the drift at this time that should not be overlooked in placing an estimate on the value of the property. As it goes south in the direction of the shaft the quartz has become of a uniform appearance throughout and cannot be distinguished from that in the Republic mine. There seems no question as to the future of the Princess. It is no longer a prospect but a mine. When the ore chute that is such a prominent factor in the history of the Republic passes out of its own ground into the Jim Blaine it is but reasonable to believe that it will continue from the latter into the Princess Maude ground. The pitch of the chute will preclude any other result.

FACE OF SOUTH DRIFT, PRINCESS MAUDE.

The company was incorporated with a capitalization of 1,000,000 shares, having a par value of $1 each. The stock was offered to subscribers at the low figure of one cent a share, and within five days all the promoters' stock had been taken and active development was begun on the claim.

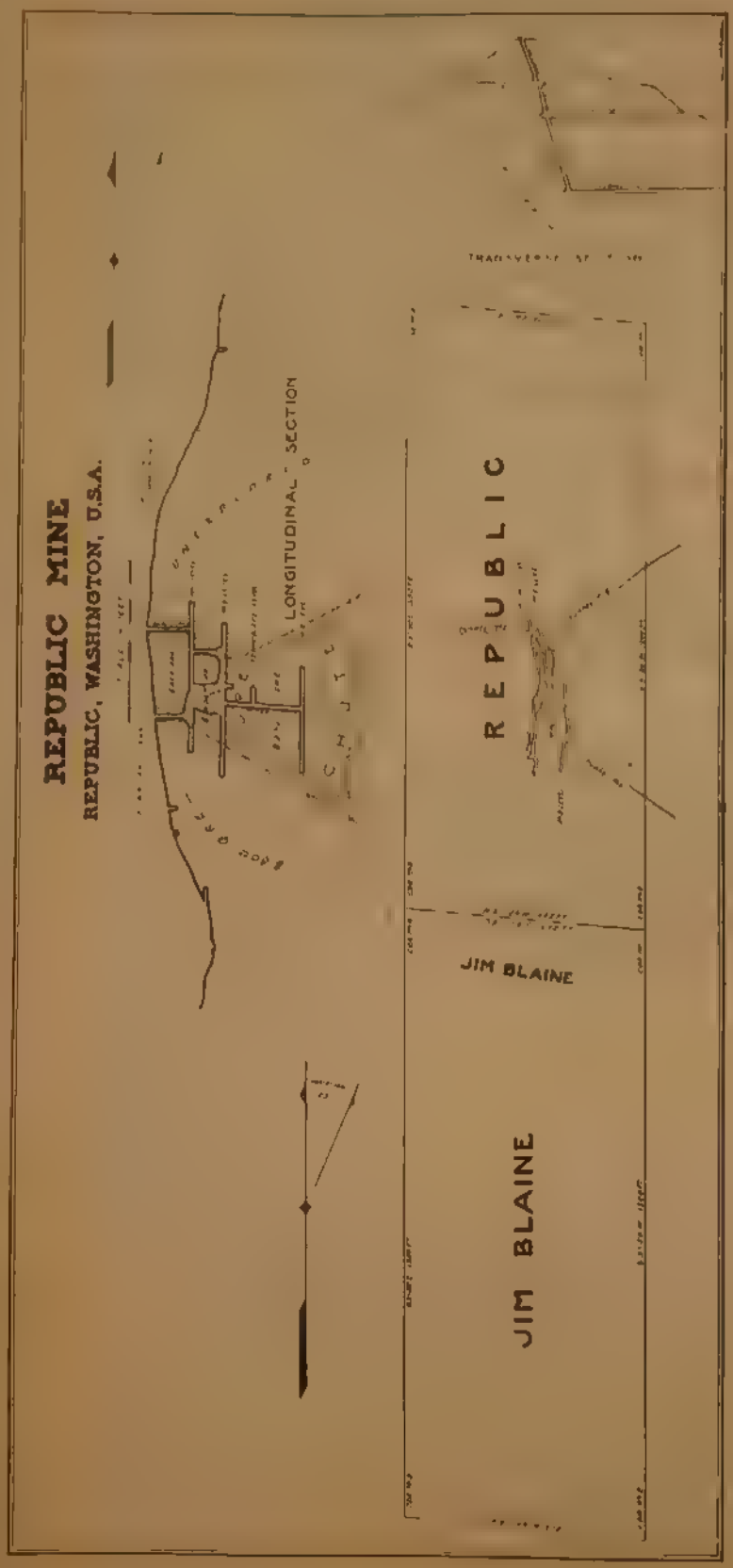
Since July 15, 1898, at which date the shaft was begun, there has been no cessation of work on the property. The shaft was sunk to a depth of 104 feet, and it then became apparent to the management that machinery would have to be put in or some new plan of operating the claim devised. It was decided that the cheapest plan was to run a tunnel which would drain the mine to a depth exceeding 200 feet, and would save a large expense in hoisting the rock to the surface. In October the work of excavation for a site for the proposed tunnel was begun, and in a few days thereafter the actual work of constructing the tunnel was inaugurated. After the ledge had been cut and crossed a drift was started along the ledge in a southerly direction. This drift will be continued until a point is reached directly beneath the shaft, when a raise will be made until the shaft is reached. This course becomes necessary in order to ventilate the mine and also to open it up ready for stoping.

The ledge, which has an average width of about seven feet, passes out of the Jim Blaine ground through the point of the Dude Fraction into the Princess Maude and thence into the Butte and Boston. The ledge will shortly be cut again near its southern boundary line by the Jim Blaine tunnel at a depth of about 175 feet. Within the next three months it is quite probable that the Princess Maude will be among the best developed claims in the district, and will be in condition to be a shipper.

PRINCESS MAUDE TUNNEL.

JIM BLAINE.

"Jim Blaine" one of the principal properties of the Republic Camp is



dest and to make a great mine. Owing to the fact that this property has been until recently under the same management as the Republic development work has not been pushed, the property being to a great extent developed through and by the working of the now famous Republic. The south end of the Republic on the 700 level is now but a few feet from the Jim Blaine north end line. The ledge at this point is about 10 feet wide showing its strength to be undiminished and it has in the middle of a pure white almost crystalline quartz which assays as high as $225 per ton in gold. The solid clean ore is about four feet wide.

From the accompanying map it will be seen that the Jim Blaine is here to-day the Republic ends at a little greater depth and with the same amount of development on the Republic will become equal to and in all probability show even greater values than the Republic.

From a mining standpoint the Jim Blaine is as yet an undeveloped prospect, nevertheless when the workings of the Republic are considered and the immense importance appreciated that the pitch of the big ore bodies in the Republic mine are to the south taking them directly into the Blaine ground at a depth of only a few hundred feet it becomes apparent that the property is of immense value and with active development capable of producing dividends equal to if not surpassing the much heralded Republic.

The company has a very able directorate all mining men standing at the head and in charge is Mr. Patrick Clark the president who has acquired through his vast capabilities and success as a mining operator a world wide reputation and at the same time amassed fortunes for his associates and followers (stockholders). Spokane is now adorned by residences valued at sums ranging from $10,000 to $50,000, owned by men who but for Patrick Clark would today be occupying but humble cottages.

Large business blocks are a monument to his success and energy, while the town of Republic owes its birth to his wonderful foresight. Yours truly,

BRITISH CANADIAN INVESTMENT AND MINING SYNDICATE.

Cananea Mines Sold

A controlling interest in what George Mitchell claims to be the richest copper prospect on the American continent was sold to a syndicate of New York capitalists.

Mr. Mitchell was for four years the superintendent of Senator W. A. Clark's United Verde mines at Jerome, Ariz.

"Our deal was finally closed up at Phoenix," said Mr. Mitchell to an *Express* reporter. "The new purchasers took only control in the mines which I'll guarantee to be the greatest copper property in America. Our location is La Cananea, District of Arispie, State of Sonora, where we have a smelter of 200 tons capacity as part of our works. The mines cover 3½ miles of territory and are at present netting a good sum per day. Some of the stuff taken out shows up 98 per cent pure copper."

The new owners of the controlling interest in the mine are to improve it thoroughly, and will greatly increase its production. About 200 men are now employed.

Mr. Mitchell was adverse to disclosing the exact amount of the purchase price paid by the New Yorkers. He volunteered after some persuasion the information, that $1,500,000 might be put down as having been about the right figure.

When Mitchell left the Clark mines at Jerome the employes clubbed together and presented him with a beautiful gold watch, a chain and locket made, made of pure native gold, and a large solitaire diamond ring all of which he wears, of course, with considerable pride. He has for years had a reputation as one of the most noted copper experts in the world.

"Marcus Daly and W. A. Clark both had experts examine the Sonora mines, controlling interest in which has just been sold," he said, "and the experts always walked past the big mineral deposits which our people have since uncovered. Most of the stuff has been uncovered during the past two years."

In Siskiyou county there are 225 stamps and two Huntington mills. Of the stamps 150 are in continuous operation. Some run full shifts, some do not, this being governed by the water supply. About 40 stamps are idle from various causes, and 35 are worked occasionally.

AUTOMATIC CUT OFF ENGINE

Accompanying illustrations represent the Class B Standard Center Crank Automatic Cut-off Engines being put on the market by James Leffel & Co., Springfield, Ohio. They are intended to meet the demand for a thoroughly good, [illegible] and easily cared for line of Automatic Engines in the smaller sizes up to 50 h. p. that will prove durable and economical in operation. Fig. 1 is view showing steam chest side, while fig. 2 illustrates the governor in the band fly wheel and fig. 3 shows cylinder side.

The main bed or frame is of substantial proportions and of a design affording extra strength and stiffness. The cylinder and steam chest are of overhanging type cast together, and firmly bolted to bed, bored out, and have very generous surface. Cross head is of improved mechanical design having pin about mid-center and provided with gun metal wedge shaped shoes above and below, arranged for convenient adjustment. Manner of fitting cross head pin enables easily keeping same absolutely tight at all times. Piston rod is of steel, and turned to a tight force fit in piston, with suitable shoulder, against which piston is forced on rod and end of latter is then securely riveted over, tightly and firmly holding piston in place. The connecting rod is provided with extra heavy brass boxes at each end, easily adjustable for taking up wear and keeping distance between centers same at all times. Main shaft is extra large and strong, forged in one solid piece, from best quality hammered iron or steel, and is provided with suitable counter balance discs, securely attached. The rectangular form of skeleton slide valve is used, balanced by being fitted with a pressure relieving plate on back between valve and steam chest lid and is arranged to afford necessary relief in case of water in cylinder and also made adjustable for wear. This gives a simple efficient and well balanced valve, that is easily understood, and no more trouble to care for than the ordinary type of plain slide valve. A simple and convenient device not shown in cut is provided for draining cylinder, same being operated by one lever and having outlet from each cylinder cock suitably connected to exhaust pipe.

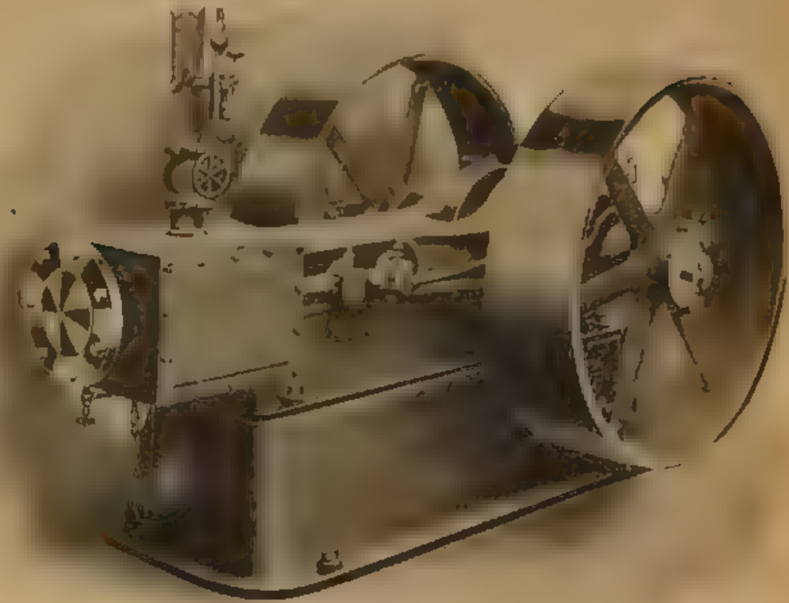


FIG. 1

FIG. 2

These Engines are equipped with the Rite's Governing System which is the acme of simplicity, as shown in fig. 3. The governor consists of one piece, comprising the arms and weights with one spring connection and is pivoted on one hardened steel pin, nothing complicated, no links, no numerous joints or complicated parts. This governor, with the balanced valve used, affords a regulation that is practically perfect, speed being constant, and the same with engine loaded or running empty.

The manufacturers will be pleased to quote prices and furnish prospective users with any additional information desired regarding these engines.

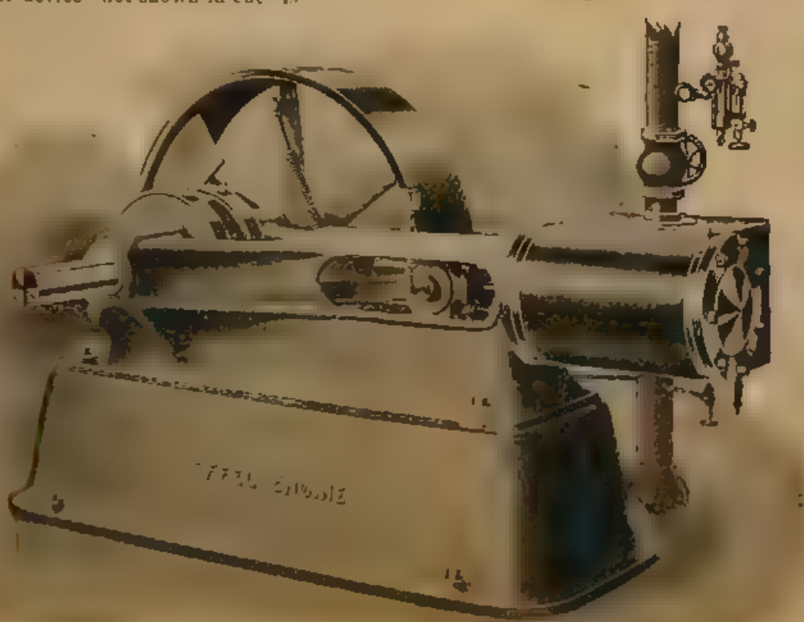


FIG. 3

The famous Mariposa estate, territorially one of the largest gold mining properties in the United States and the finest quartz property developed in California, is to be reopened and worked after a suspension of operations for nearly thirty five years. The gigantic nature of the undertaking makes the news of the first importance, and promises to have great influence on the mineral development of California.

The Mariposa grant, as it is often called, is located in Mariposa county and covers an area of 44,387 acres or about seventy square miles, being a strip of land fifteen miles in length and of an average width of five miles. The principal developments in this great territory are the Princeton, Josephine and Pine Tree mines. In addition, there are also the Elizabeth, Green Gulch, Mariposa, Mount Ophir and Mexican, but although the tract is intersected by a network of veins they are scarcely more than prospects.

From about 1858 to 1865 the property was extensively worked, the Princess mine yielding $3,000,000 down to the 500 foot level. Since then operations have been conducted in a tentative fashion, mostly in the way of tunnels. Not giving results hoped for, they have been allowed to lie idle.

Miscellaneous Mining News.

ARIZONA.

S. P. Creasinger of Los Angeles has bought a group of copper mines in Lost Gulch, near Globe, from W. T. McNelly, W. F. Westbrook and Dory Harris. A company is to be formed with $1,000,000 capital, and called the Creasinger Mining Company; to work the mines. In the purchase the former owners of the mine receive 49 per cent of the stock. It is said that $25,000 in stock has been set aside for improvements. The consideration of the sale is said to be $1000 in cash and 473,000 shares of the stock. The claims in the sale are as yet only prospects, but it is said that good copper ore has been disclosed.

The Equator mine, on which work has been suspended for a long time on account of litigation, will soon be reopened. A compromise has been effected by which the property is divided in two. W. A. Clark, who got one-half in the division, calls his property the Copper Chief of Jerome.

But the greatest interest is felt in the Dillon mine, located by Ralph Dillon, who is now backed by Scotch capital. About $64,000 of machinery has already been put up, and more will be ordered when the mine shows up well enough to justify it. A great deal of development has been done in this mine. The Dillon lies in sight of Jerome and near the United Verde mine.

A bulkhead is being built by the Copper Queen Company of Bisbee, Arizona, in the rear of the fire station as a precaution against floods.

A strike of 1200 ounce silver has been made on the American Flag in the Wallapai mountains. The mine is one of the old producers that made Mohave county men rich.

CALIFORNIA.

AMADOR COUNTY.

Gibbon & Horn have started their big clay and gravel washer at Jackson. For the past month they have been making repairs on the machine, putting in a new hoist, etc. This machine is a perfect success in washing clay, and mining men are greatly interested in its operations.

Frank A. Stewart and Charles Lavala, owners of the Katherine mine in the Pioneer district which is located near the Defender, are shipping some high-grade sulphuretted ore. At present the sulphuretted lead is sixteen inches wide, and as they sink it is widening. The quartz vein is two feet wide and assays about $70 per ton. The owners are rapidly developing this mine, and it bids fair to be of considerable value.

Some of the directors of the Bellwether at Jackson are in the East, and are having good success in the matter of disposing of the stock of the company. They expect to get in condition to resume operations on the mine about the first of August.—*Amador Ledger.*

CALAVERAS COUNTY.

There has been encountered in the Gwin mine a ledge at the lowest depth of the shaft, which gives promise of putting that mine in the list of high-grade gold producers. The ledge, where encountered, is two feet thick and assays $30 per ton.

The Thorpe mine at Angels has closed down. It has been reported that the mill would be the only department closed, and the sinking operations would be carried on, but a statement made by one who is in a position to know says the shut down will be complete.

EL DORADO COUNTY.

The Bowlder mine, on Webber creek, seven miles from Placerville, was closed last week on account of a shortage of water to run the mill. The water supply on the Gold Hill branch of the El Dorado canal will be needed for the next three months by the farmers and horticulturists in that vicinity.

The Crystal Gold Mining Company is the name of a new corporation organized to mine in El Dorado county, the company's principal place of business being at Sacramento. The directors are Henry E. and William E. Kleinsorge of Sacramento, F. L. Simpson of Grizzly Flat, S. C. and Charles Boarman of Canyon. The capital stock is $100,000, of which one half is subscribed.

FRESNO COUNTY.

W. R. Brown of Pine Ridge found a ledge of iron sulphurets near the road about ten miles from Fresno. He procured a pick and shovel and soon discovered that the ledge was fully ten feet wide and running northwest by southeast, parallel with the railroad. Mr. Brown took a chunk of the ore to town. It is very heavy and appears to be iron sulphates in which is imbedded gold bearing quartz. Mr. Brown will have the ore assayed at once, but as the ledge is on patented land, he will not divulge its exact location until he is advised of his rights in the premises. This is the first ledge or lode of mineral-bearing rock ever discovered on the open plains.

SAN BERNARDINO COUNTY.

It is announced that H. C. Steele and E. F. Zombro of San Bernardino have bonded the Los Angeles mine in the Dale mining district for $40,000, and will commence development work on a large scale.

SAN DIEGO COUNTY.

The nineteenth report of Receiver C. W. Pauly of the Golden Cross mines, covering the month of May, has been filed in the Superior Court of San Diego county. The clean-up for the month amounted to $18,394.03. The receiver paid out during May, for the benefit of the property in his possession, claims aggregating $13,586.75. After making all payments $24,442 47 remained in the hands of the receiver. The payroll for the month was $7000 and $600 was paid for fuel.

There is a mystery over the Ranchita mine, which Gail Borden and associates recently bought for a price said to be $150,000. A miner recently from Banner, San Diego county, reports that the Ranchita has been shut down by its new owner and the miners have been paid off and discharged, leaving only two men in charge to take care of the property. It is said that the cause of the shut-down is a disagreement between the new proprietors and the former owner, Cave J. Couts, but the exact nature of it is not known. There were eighteen miners employed in the mine when the shut-down took place, which was about two weeks ago. A five-stamp mill had been added to the place, and everything was in readiness to begin work with the new mill. A test was ordered and the machinery was started. Twenty minutes later orders were issued to close the mill, shut down the mine and pay off the men.

The orders were a complete surprise to everybody employed in the mine, as everything had been running smoothly and preparations had just been completed for developing the mine on a larger scale than had ever before been attempted. The owners gave no reason for shutting down the property, and further than the unconfirmed rumors which are afloat in the camp, and the statement that there had been a disagreement between the present and the former owners, nothing is known by the people of Banner concerning the shutdown. The miners employed in the Ranchita were offered work in mines at Randsburg owned by Mr Borden, and all took advantage of the offer and have gone to that camp.

Mrs. E. H. Hendsch, dressed in male attire and under the name of E. H. Harding, an alleged mine expert, attempted to get into the mine but was not permitted to do so by Cave J. Couts, who was in charge of the property. The cause of this procedure has not as yet been made apparent.

The American Girl

The American Girl Mining Company just incorporated with H. H. Markham as President; Thomas Johnson Vice President; G. H. Coffin, Secretary; F. S. Daggett, Treasurer, has just purchased five mines near Yuma, and work will begin August 1st. A plant will be established.

The Grapevine District.

Aside from the interested parties the reports of the disinterested practical miners who have visited this new district southwest of Banner, in San Diego county, indicate that it is doubtless a very promising field of favorable prospects that will be good for one-half of the next century. The mines are easy of access from Los Angeles via Temecula per rail, then stage to Julian, or from San Diego via Fosters per rail and stage to Ramona and Julian. It is an easy route for the construction of a railroad from Seven Palms or Dos Palmos on the S. P. R'y. Abundance of water and wood are procurable in close proximity to the mines, while the climate is perfection. All the necessaries of life and even the luxuries, such as fresh vegetables and fruits, are also to be had. The veins of ore run north and south. They are of immense length and widen out in going down. In all probability they are a continuation of the Mother Lode that skirts the eastern and western foothills of the Sierra Nevada range. It is a sulphuret ore that carries a great deal of silver and copper. It is reported that one of the purchasers of some of these mining properties, a Mr. Clark of British Columbia and Washington State, intends to erect a large cyanide plant there, which will be a great saving in transportation in treating the ores. From all indications a great mining camp will eventually be established in the Grapevine district. The natural conditions exist to make such, and there is no mistake as to the richness of the ores and its immensity. It and the adjacent country south and west is practically a new country, unexplored and undeveloped, and when once brought forward to the attention of mining men and capitalists some surprising results will be shown.

SISKIYOU COUNTY.

The Schroeder quartz mine, in Siskiyou county, has just been sold to the Canada Mining Company. The price is reported to

be $1,000,000. This is one of the largest sales of quartz properties ever made in Siskiyou county. The Schroeder mine has an excellent reputation as a paying property, and the purchasers will reap handsome profits from their investment. The property is situated in the Deadwood mining district, about seven miles from Yreka and is finely developed, Mr. Schroeder having tapped the ledge at a depth of about 1200 feet. Just over the divide from the Schroeder mine is the Humbug mining district, where some excellent prospects have been discovered.

TUOLUMNE COUNTY.

The Bell mine, Tuttletown, is being unwatered preparatory to the resumption of the work of sinking the shaft.

The break in the main flume above Sugar Pine caused a partial shut down at about all the leading mines north of the Tuolumne river last week and put a stop to road sprinkling as well.

The mill on the Mountain Lily mine on the Mother Lode, which has been running steadily for the past six weeks with flattering results to its owners, shut down for a few days July 1st to make a cleanup.

Prof. J. P. Von Dussell has struck rich ore on the Stanislaus, near Robinson's Ferry. A company of Illinois capitalists has taken hold of the property and is delevoping it.

TULARE COUNTY.

A temporary closing down of the Minnie-Ellen mine in Tulare county, pending arrangements for an extension of time on the bonds is reported. The time was up on the 22nd of July, at which date the whole of the purchase money was due, or in default of payment the mines revert to the owners. F. Cook, one of the owners, offered an extension of time if MacDonald, who gave the bond, would augment the price. This, it is understood, MacDonald has refused to do.

COLORADO.

Findley's new strike at Cripple Creek is important. It opens entirely new ground. The vein is claimed to be very strong and seven feet wide. The ore is reported as running—or rather assaying—only an ounce and a half The strike is on the north block. It was made in a south crosscut from the shaft at a depth of ninety feet. The strike is close to the west line of the claim, and is generally conceded to prove beyond question that the Findley contains the big Hull City-Atlanta vein, and at least 500 feet of it. The Steelsmith lease will have a good stretch of it. It lies over 100 feet north of the Carpenter vein.

Rich ore has been encountered in the Tillery lease on the Orizaba There is a pay streak ten inches wide and very rich in sylvanite, running in the neighborhood of $3000 per ton.

The Galena mine is running the 500 and 550-foot drifts from its shaft. They also have a number of leasers at work and about twelve men in all find work underground on this property. Several shipments of iron ore have been made recently, and a considerable amount of mill dirt has bean sent to the mills at Black Hawk.

IDAHO.

Manager Hunter has received instructions from the London office to begin work on the mill level tunnel, at the De Lamar mine, and preliminary work has already been commenced in making surveys and arranging to begin the actual work. The compressor now up at the mine will be moved down to the mill, to be placed so that it may be run either by steam or water power, and power drills will be put in place. This means a two years' undertaking, employing a force sufficient to keep the work going continuously. The tunnel will cut the veins in the mines below the lowest present depth attained; will do away with all the pumping plant, and eventually do away with the use of the present tramway and bring all the miners down town.

It seems that a dredging process has at last been found that saves the flour gold of Snake river. The gold in the Snake river is so fine that it takes from 900 to 1000 colors to make one cent, and it is so light that when dry it floats on the top of the water like so much bran. The difficulty of saving a profitable per cent of this gold is therefore apparent, but this dredger seems to do this without trouble. The machine is in operation at Bridge island, near Payette, where it runs day and night.

MICHIGAN.

Michigan Mining Notes.

The Lake Erie Asphalt Block Co. has about completed the construction of the mineral storage bins on the Tamarack stamp sand pile. The conveyors and dock are partly finished and will be completed soon. In a few days the work of filling the bins will begin.

Attention will soon be given the old Goodrich mine, which has lain idle so many years. Arrangements are now under way for a resumption of operations at this property. There is known to be a 12-foot vein of hematite of bessemer grade, and besides this there is a large body of silicious ore which will yield about 45 per cent iron.

The Oliver Mining Company has secured an option on the Hartford property, Negaunee, and will immediately proceed to give it a systematic test. The Hartford lies immediately east of the Cambria, and the Cambria ore is pitching in that direction. The Hartford will probably have to sink to a depth of more than 700 feet to catch the extension of the fine deposit now being worked by the Cambria. A diamond drill boring will be made It will be vertical and located near the old pit at the Hartford.

MISSOURI.

Joplin's Lead and Zinc.

The official figures for the Joplin district show an output of lead and zinc valued in 1898 at $7,000,000. For the first twelve weeks of 1898 the output amounted to $2,274,552, and for the first eighteen weeks to May 6, it amounted to $3,880,264. This proportion, if maintained, would bring the value of the 1899 output to $12,000,000.

MONTANA.

The Philadelphia Company, that has been working since May 1, digging ditches on More creek, ten miles below Idaho City, has the work completed and is now at work on the bedrock flume. The company has placer ground extending along the creek a distance of four miles, and it will give big returns next year and some big clean-ups may be made in the coming fall.

Work is progressing rapidly on the new dredge on More creek

Thomas Barry has put a force of men at work on the Olympia gold quartz mine on Summit Flat

Considerable development is going on in the ledges at Miller diggings, ten miles north of Banner. The veins are from 20 to 40 feet wide, but the ore is not usually high grade. Mining men however, say that they are just such properties as companies want. With good sized mills they will pay handsomely. The district is large and some of the ledges crop for three and four miles in length.

The Moriarty brothers are getting ore out of the Boulder, on Elk Creek, and will start up their 30 stamp mill shortly.

John Kinkaid has a force of men at work in the Elkhorn. They are searching by crosscuts at a depth of 500 feet for the ore chute that yielded more than half a million dollars from the upper works.

The New England Dredging Company, which is operating on More creek, has sent a drilling machine to Stanley basin to prospect a group of claims owned by it.

William R. Byrne is getting some exceedingly rich free gold ore out of a claim at the head of Deer creek, located by him a few weeks ago.

The drift run from the bottom of the Washington shaft has cut into a body of ore eight feet wide. The rock is all good milling ore. It is very gratifying that the discovery is made that the ore goes down, as the chute was lost eight years ago when work was suspended, since which time the mine has laid idle.—*Anaconda Standard.*

NEVADA.

The sale of the Vina C. group of copper and gold bearing claims at Contact, Nev., for $30,000 has just been accomplished by Miss B. T. McMasters, the purchaser being Richard J. Boiles of Colorado Springs. He was one of the original owners of the Mollie Gibson mine of Colorado, from which nearly $5,000,000 in dividends was derived in about three years, and has been one of the most successful miners in that state.

The new mines discovered by T. J. Bell and J. G. Court, south of San Antonio last spring have been bonded for $100,000 to H. A. Cohen of DeLamar. There are eight men working on the claims and a fine ledge of rich ore has been struck in the tunnel at a depth of 65 feet. Water has been obtained in the well sunk about three miles from the claims, and everything points toward a steady and successful development of the mines.

NEW MEXICO.

The Last Chance mill, near Mogollon has been started again and is running ten stamps upon a good grade of ore from the Last Chance mine. It is reported that ten new stamps and a lot of other new machinery has been ordered for the mill.

On the Confidence mine near Mogollon the work is confined to development which is being done by sinking shaft No. 2, located about 600 feet from the mouth of the main

adit level. This shaft has attained a depth of [illegible] feet and it is intended to sink it to a depth of [illegible] feet, when connections will be made with the main working shaft, which is equipped with the big electric hoisting machinery. When the connections are made there will be large ore reserves opened which will insure a [illegible] mill run. There are several thousand tons of ore in the bins at the mine and mill, but the management proposes to develop large reserves before starting the mill.

Thomas C[illegible] and George S[illegible] have [illegible] upon the [illegible] Silver Bar mine near Cooney. They have repaired the pipe line which [illegible] the water motor at the mill and have put all the machinery in perfect order for economical working. The mill has been started and is turning out rich concentrates. The ore is being mined from a winze 90 feet in depth at a point about [illegible] feet from the mouth of the main adit level. The ore is [illegible] gold and silver and the concentrates [illegible] copper.

A [illegible] ton shipment of gold and silver ore [illegible] at $[illegible] per ton was made from the [illegible] to the El Paso smelter during the past week.—*[illegible] Personal Pioneer.*

OREGON

The Twin Springs Mining Company of [illegible] which owns the Deer Lodge mine at the head of Rock creek about 1[illegible] miles west of Baker City, will resume shortly after a shut down since last February on account of deep snow.

The Deer Lodge mine is situated on the North Pole and E. N. F[illegible] road crossing the mountains at the head of Rock creek, and was purchased last year by the Twin Springs Company from Andy Ha[illegible]en for $[illegible],000, $[illegible] of which amount was paid down.

Work done last year made a good showing and the Deer Lodge is considered to be one of the big mines of Baker county.

SOUTH DAKOTA.

M[illegible] J. Morgan and James Rog[illegible] of Deadwood, are taking out [illegible] copper ore from their mine [illegible] within the city limits of Deadwood on the south side. Two shafts have been put down, one of them 4[illegible] feet. The ore runs as high as [illegible] per cent copper and the lowest grade is good enough to ship to the smelter. The mine is located directly on the copper belt.

The best cyaniding ore in the country is thought to be found in the low grade belt at Ragged Top. It is a lime ore and a very high per cent of extraction is given by the process. The ore does not require to be crushed fine, chunks as large as a person's hand going through with a high extraction. The ore is porous and the cyanide solution enters freely. The ore in the district is found from the grass roots down to a depth of 4 to 6 feet and it is easily mined.

There is strong talk of erecting cyanide plants in Yellow Creek, Strawberry, Squaw Creek and Portland districts and it is practically been decided to build plants in some of these camps. The process will treat about [illegible] per cent of the Black Hills ores, and it is recognized as the cheapest process, with the possible exception of the stamp mill in use today. Before the close of the season there will be no less than eight cyanide plants in successful operation in Lawrence county, which will have a combined capacity of treating 200 tons of ore per day. One great thing in favor of the process is the cheapness with which a plant can be constructed. Another point in its favor is the small amount of water needed.—*Black Hills Mining Review.*

UTAH.

Work is being pushed on the Coes property, Dugway district, and fifteen to twenty tons of ore is stacked up now ready for shipment.

At the Beckham, Dugway district, the working shaft is following down a streak of high grade ore running 50 ounces and over in silver per ton.

On the Ne[illegible], Dugway district, some very fine copper ore is being mined with increasing quantities and values. Some very fine grade ore which it is thought will assay very high is [illegible] in the Sa[illegible] group.

Owing to the [illegible] of the Highland Boy smelter, the tram was unable to be operated the last [illegible] days or two. The mine is supplying ore faster than the smelter can handle it.

At the Black Warrior the ledge is being crosscut 525 feet from the surface with most gratifying results. Some very good looking quartz and iron is yielding good assays.

A large force of men are at work on the north and south [illegible] of the Helvetia. The values continue to improve and large bodies of good milling ore are being blocked out.

The Crown Point is looking fine. The tunnel is in [illegible] feet. They have stringers of ore [illegible] and it looks as if they will break into bodies of ore at any minute.

WASHINGTON.

The Insurgent

Big news comes from Republic concerning the recent development of the Insurgent. Since the first of July the vein of the property has been [illegible] by the drift [illegible] following the vein in the Lone Pine side line into the Insurgent location. The vein turns to the north and is running parallel with the Black Tail vein where the latter crosses through the Insurgent. July 11th, the Spokane office of the company was advised by Superintendent Ryan that the mine showed five feet of ore carrying higher averages values than have yet been found at similar depth for so great a distance in the camp.

"It will be remembered," said President Dennis of the Insurgent Company, "that the east drift of the Lone Pine, on one of its cross veins, was driven 30 feet beyond the west line of the Insurgent and into the Insurgent ground. The Insurgent company continued this drift in an easterly direction for a distance of about 50 feet when about July 1 the vein began turning sharply to the north, just as it approached near to the Black Tail vein which runs in a northerly and southerly direction for a distance of 1000 feet across the Insurgent ground. Instead of intersecting the Black Tail vein as it was supposed the crossvein would do, it turned to the north and is now running due parallel with the Black Tail vein, both of these veins thus apexing on the Insurgent ground.

"The news telephoned by Superintendent Ryan was to the effect that the drift had been driven for [illegible] feet, following the parallel vein beyond the point where the vein turned, and that [illegible] the entire distance was a clean five feet between clearly defined walls.

SCHAFF [illegible]

In the course of the [illegible] run since July 1, eight sample assays across the [illegible] of the vein have been taken with the following results:

July 1. Silver, $6.1[illegible], gold $7[illegible].23, total $81.[illegible]

July 3. Silver, $1[illegible], gold $[illegible].12, total $1[illegible].12

July 4. Silver, $8.[illegible]8, gold $121.53, total $130.41

July 5. Silver, $8.22, gold $142.60, total, $150.82

July 6. Silver, $1.[illegible], gold $40.[illegible], total, $42.[illegible]

July 7. Silver, $4.[illegible]2, gold $33.0[illegible], total $37.[illegible]

July 8. Silver, $7.[illegible], gold, $84.7[illegible], total $[illegible].[illegible]

July 11. Silver, $[illegible].52, gold $103.41, total $1[illegible]

The average of the eight assays is $[illegible].[illegible]2, and each assay is reported by the superintendent to be an average of five feet of ore.

WISCONSIN.

North Wisconsin Company Merged Into Chippewa Copper Mining Company.

Secretary Woodward has forwarded a copy of a statement of the plan of transfer of the North Wisconsin Mining Company to the reorganized company, the Chippewa Mining Company. It gives all the details of the transfer and holders of stock in the old company will soon receive certificates in the new.

The new company is to pay all the debts of the North Wisconsin Company and the latter is allotted 1,[illegible]75 shares in the new company. Walter Fowler made the deal, and is authorized, according to the statement, to issue the vouchers for which stock in the new company will be exchanged as soon as they can be prepared for delivery. The ratio has been decided, and Mr. Fowler will make out vouchers at any time. Certificates may be sent to F. A. Woodward at Boston if so desired, and the new stock will be sent direct from the Boston office.

FOREIGN MINING NEWS

CANADA

The most important mining deal that has ever taken place in Ontario has just been closed. The Graham McKellar group of iron properties on the Atikokan range, consisting of sixteen locations containing 1,200 acres and covering four and one half miles of the range, has been bonded to Ronald Hunter, representing American capitalists, for $350,000 for eighteen months, that the parties may test the properties. The sum of $10,000 was paid in cash for this privilege.

LOWER CALIFORNIA.

It is said, on the authority of Capt. W. M. Freeman of San Diego, that negotiations for the sale of four copper mines in Lower California for a half million dollars to Martin White & Co., of London, England, have been

going on for some time past and that the deal is expected to be consummated within a few days. The mines are the San Fernando, Peabody, Moromosa and Butler, the first-named belonging to Gen. E. C. Humphreys and Mr. Brophy, the latter of Arizona, and the other three to Capt. W. M. Freeman.

GENERAL NEWS.

Wireless telegraphy will perhaps have its first great test during its holding of the National Export Exposition, to be held in Philadelphia during the fall. No effort will be made to duplicate the Eiffel Tower, but a structure of some kind is being considered that will hold up a copper wire 1000 feet in the air.

It is claimed by Marconi, the inventor of wireless telegraphy, that if this is done by the Exposition people, he will telegraph by flashes of electricity from the top of Eiffel Tower, in Paris. A feat of this kind successfully performed, will be the wonder of the world and worth crossing the ocean from Europe to see.

The Cling-Surface Manufacturing Co., of 167-172 Virginia Street, Buffalo, New York, report rapidly increasing sales, not only in this country but many orders are being received from Australia, European and South American countries, with a fast-growing business in Mexico, all seeming to prove that "The days of tight belts are over" is having the backing of belt users. A recent letter of Brown, Durrell & Co., Boston, voices the general verdict: "Having tried Cling-Surface on my 12" dynamos belt, I have been able to carry full load with 22" sag on belt, with no perceptible slip. It surpasses my expectations and I can cheerfully recommend it to do all that is claimed for it if directions are followed."

ELECTRICITY IN COAL MINING.

BY JOHN PRICE AND FRANK P. THOMPSON

The Davis Coal and Coke Company.—The Davis Coal and Coke Company's plant at Thomas, West Virginia, is so efficiently equipped with this compound electric service as to be worthy of a short description. The company operates two miles at Thomas, the Thomas drift and the Davis shaft, and one at Coketown, a drift.

The power station is a roomy brick building containing an Ames 200 hp. engine direct connected to a 150 kw. 500-volt direct-current generator; two Atlas cycloidal heavy duty engines of 150 hp., one of which is belted to a 100 kw. 550 volt three-phase alternator, and the other to a 78 kw. 550-volt direct-current generator. The last mentioned generator has been installed temporarily in the place of a second 100 kw. three-phase 550-volt alternator which has been operated in parallel with the other three-phase alternator. This 75 kw. machine is used to help the haulage generator.

The coal is hauled by horses from the "rooms" to convenient points where it is collected into "trips" of from six to twelve "wagons." The inside haulage motor, a 14 ton G. E. T. M. M. 35, takes these "trips" and hauls them to a central point of the breast and there they are combined into larger "trips" of about 15 to 35 wagons and hauled to the mouth of the mine by another similar motor. Each of the haulage motors gives 3,500 lbs. draw-bar pull. At Coketon, two miles away, another 14-ton haulage motor is installed.

The alternating three-phase generator is used for operating three 10 hp. induction motors for driving small pumps, one 5 hp., one 10 hp., two 20 hp., and one 30 hp. induction motors for operating elevators; one 5 hp. induction motor for a car lift, and three G. E. chain coal cutters. The induction motors for driving the pumps are located at the foot of the side entrance both at Thomas and Coketon. One 10 hp. induction motor connected to a pump having a 5 inch suction 250 feet long, and a 4-inch discharge pipe, 750 feet long, with a total elevation of 98 feet, pumping 106 gallons per minute, was tested and found to take 11,000 watts. Induction motors are also used for driving fans and conveyors which carry the slack coal from beneath the screens to the bins, which is stored until needed to charge the coke ovens.

Haulage — Electric haulage equipments have been so long in use as to be now in a thoroughly good state of development. Even yet, however, the following faults may be observed in some of the machinery: Poorly acting brakes, unwieldy arrangements of the various controlling levers and trolley poles, brake rods or other projections too close to the track, and unsatisfactory speed and power regulation. Although some of these seem of small importance, any one of them is apt to seriously interfere with efficient work. The brakes on a mining locomotive should be very powerful and quick-acting, likewise the arrangement of the motorman's seat, brake-handle, controller and sand-box lever should be such that the motorman can control his machine with the greatest possible dispatch and ease. Locomotives have been placed in mines with absolutely no provision for the motorman, and others where the lever arrangements are so unwieldy as to make the quick control necessary to safe operation impossible.

In large coal operations economy is often to a large extent dependent upon the rapidity with which the wagon trains can be moved. Heavy grades both in favor of and against the load are frequently to be found. In order to draw a large load and make quick time, the design and control of the motor should be such as to give an unusually great draw-bar pull at low speed, and at the same time have points of comparatively high speed. This condition is not properly met at present by all of the mining locomotives in operation. In one mine, which has come recently under the writer's observation, a slightly different design and arrangement of control in the locomotive would permit the handling of much larger loads at a great saving.

The power-house load curves of haulage are very similar to those of other electric railway work.

Coal Cutting.—Under suitable conditions, under-cut coal cutters will permit a great saving of labor, and therefore of expense, in soft coal mining. But in a large number of cases such cutters have been thrown out as unsatisfactory, and have been replaced by compressed air drills or other apparatus. In mines where curve veins abound, they have ordinarily given much trouble. The cutter strikes the clay vein and sticks, or, worse, bends, causing it to wedge tightly. This necessitates digging out with the pickaxe and expensive repairs. The most serious difficulty seems to arise from poor mechanical design and construction, combined sometimes with electrical faults. It should be possible to overcome these difficulties. In one mine where great trouble of this nature was previously experienced a new set of machines is now giving great satisfaction.

In cases where under-cutters cannot be made to work, there seems no valid reason why electric drills could not be substituted, which would give as good service as compressed air, while at the same time preserving the valuable advantage of an all electrical plant.

Electric Pumps.—Electric pumps run by induction motors give very satisfactory service. The conditions met with in mining often necessitate frequent re-location of the pumps, and in this respect the electric pump is by far the most satisfactory. The attention required is certainly a minimum. A particular pump tested ran about ten hours per day, and the only attention required was that necessary for starting, stopping and lubrication. Some mine owners have objected seriously to the electric pumps. In most cases these objections have been due to the compact arrangement of the pump and motor. In one pump which came under our observation, a 10 hp. pump, which was bought with the motor, was replaced by the water end of a steam pump with a great improvement in the service. If electric motors were made to suit the pumps, and not the pumps to suit the motors, it would go far toward obviating the most serious objections. When the pump must be of large capacity, and when it can be located within a reasonable distance of the steam plant, a steam pump would probably show greater economy.

Wiring and Pressure.—Wiring in mines is subject to certain retrictions which do not apply in ordinary wiring. There is no doubt that the 550 volts used for haulage is dangerous for horses. It is therefore customary in many mines to shut off the trolley current while mules are being taken in or out of the mines. If a polyphase system is installed for operating cutters, pumps, etc., in the mine, it should be run through the air courses and not through the main gangway. A pressure of 550 volts alternating is much more dangerous than the same direct current pressure. The class of labor which is usually employed in the soft coal fields is of a low grade of intelligence, and many instances are recorded of serious personal injury or loss of life from accidental or intentional contact with the wires on both 500 volt A. C. and D. C. service. Although the mine laborers may have been repeatedly warned of the danger, they continue careless about the wires. When the mine roof is low enough to be reached by the men, the common practice is to run trolley wire along one side, supported by the usual hangers. When feeders are necessary, they should be run along the same side. The other side of the roof should be kept clear.

Ordinary bare wire is preferable in mine work. The best insulation, rubber compounds, deteriorate rapidly under the action of the sulphur water. Any other insulation soon becomes inefficient, owing to the moisture which is always present in a mine.

In large operations such as those at Windber, where 20 miles of trolley are already in service, it is undoubtedly advisable to use at least 500 volts pressure for haulage. The polyphase power should preferably be used at a lower pressure for the sake of safety to employees. This could often be done, without an undue expenditure of copper, by carrying high-pressure lines overhead to air ducts, or through unused passages to suitable points for distribution, where the pressure could be

lowered by transformers. When it is necessary to run wires down a shaft through which coal is to be hoisted, the best practice would be either to use lead covered cable, or wire which has been insulated with rubber, heavily braided, and drawn into an iron conduit having the ends hermetically sealed. In many instances when wires have been installed without such protection, in old shafts, trouble has resulted from the breaking of the wires, caused by lumps of coal falling down the shafts etc.

Skilled Employees.—Too much pains cannot be taken to employ careful men as motormen for the haulage motors. The mine track is far from being up to the street railway standard. To haul a long trip of wagons over a bad track requires careful handling of the motor. The motorman should be trained to study his track and his load, and know when and where to let his trip run slack and where to keep the couplings taut. A case came under the writer's observation where a careful motorman handled a trip of 15 loaded wagons, while another motorman stalled with 10 wagons on the same stretch of track. This matter is very important from the mine owners' point of view. The cost of driving gangways and shafts is considerable, and any method which will allow of an increase in the quantity of coal which can be taken from a single opening in a given time adds very materially to the mine owners' profits

Lighting and Signals.—As the lighting of a mine is a comparatively simple matter, it is scarcely necessary to consider it here. The universal method is to light up all switch points, and only other places of exceptional importance. In large mines using a number of locomotives, an efficient system of signals should be used in the main headings. This should be an automatic block system. Mr. A. A. S. McAlister of Windber, Penn., has worked out such a system, using incandescent lamps between trolley and rails, which is working admirably.

Efficiency.—The question of efficiency, from a fuel standpoint, is of comparatively small relative value, as the difference in actual cost in fuel in the different systems is insignificant when compared with other expenses. Data available seem to indicate, however, that the all-electric systems lead in this respect. As regards the total commercial efficiency, including maintenance, labor, interest and depreciation, there can be no doubt but that the compound electrical system, using polyphase and direct currents, will give the best results.

General.—The data and statements presented in this short paper are gathered from personal experience in the mines, from mine superintendents, and from student thesis work carried on under the supervision of the Pennsylvania State College. In writing the paper it was not intended to give a complete detailed treatise on the use of electricity in mines, but to outline the most important conditions and facts bearing upon such utilizations.

THE SELF-COOLING CONDENSER.

(BY THOMAS L. WILKINSON.)

The idea of the condenser was to apply currents of air to the heated discharge water of the condenser, and so, in this cooling process, the *air* became the means of condensation instead of the water, as usually employed. For this purpose a chamber was built of wood, in such a way that the discharge from the condenser should cover large surfaces, allowing ample contact with the current of air supplied by an exhaust fan. As the water in a heated state flows over the surfaces, the air absorbs the heat of the water, and so evaporation takes place quickly. In these experiments, the cooled water required, was practically equal to the amount of feed water required for the boilers. Here was a saving of twenty five times the amount of water usually required for condensing purposes. This was the first of the trials which showed that a pound of water condensed a pound of steam An approximate analysis of the transfer of heat in these experiments, with table of results, are as follows:

TABLE OF AVERAGE RESULTS

Boiler pressure in lbs per sq in. per gauge	65
Temperature Fahrenheit degrees	
Steam	11
Cooling water initial	60
Water in pans above diaphragm	140
Water in pans below diaphragm	11
[illegible]	150
[illegible]	70
Working strokes of air pump	90
Rev. of exhaust fan per minute	710
Velocity of air in feet per minute ...	2300
Quantity of air moved in cu. ft. per min	5100
I. P. expended in driving fan	
Barometer in inches	28
Cooling water used per hour in lbs ..	1320
Steam condensed per hour in lbs	61
Vacuum in inches of mercury	10
Vacuum reduced to Barometer at 30	18½

APPROXIMATE ANALYSIS

Heat in 1 lb steam at 311 = 1208 3 B. T. U.
Heat in 1 lb. water at 140 = 149
Heat rejected by 1 lb. steam = 1208 3—149 = 1059 3

Of each pound of water evaporated in condenser probably 5·7 is at 140° and 2·7 at 115°.

Heat absorbed by 5 7 lbs. of water in being warmed from 60° to 140°=57.1.

Heat of vaporization of 5·7 lbs.=725.5.

Heat absorbed by 2 7 lbs water in being warmed from 60° to 115°=15.17.

Heat of vaporization of 2·7 lbs =299.7

Total heat absorbed by 1 lb. water=57.1 + 725.5 + 15.17 + 299.7 = 1097

Thus showing the cooling water to be practically equal to the steam used by the engine These tests showed that the application of methods of this or similar kind to be very economical and at a very small cost.

The floor space required for the cooling apparatus was small.

Enough was shown by these experiments that this method of cooling was commercially practicable. Two companies have gone into it, and many power and electric light plants are now using the self-cooling condenser. See our issue of July 1st.

The apparatus consists of two parts—the condenser—jet or surface—and the cooling tower

The cooling tower is now made of sheet iron or boiler plate, and cylindrical in form.

The size of the condenser and tower depends on the size of the plant it is operated with

The upper three fourths of the tower is filled with cylindrical tiling, 3 to 6 inches in diameter, and from 12 to 24 inches long. The tiling is so arranged that the water running down will cover all the exposed surface. At the bottom of the tower is a tank or well to collect the falling water. At the bottom and side of the tank is a fan which blows air up through the tower and tiling.

The exhaust from the engine passes into the condenser, where, mingling with the injection water, it is condensed. This condensed steam and injection water then enters the tower, at the side and above the fan, and passes up through a central pipe, to a revolving distributer, near the top of the tank, just above the tiling. This distributer is mounted on ball bearings, and has four arms of piping, perforated, and swings or revolves in a manner similar to a lawn sprinkler. So the distributer revolves, by the reaction of the jets of water which fall on the tiling and are uniformly distributed. As the heated water runs down through the tiling the fan is blowing air up through the tower, and depriving the water of its heat and evaporating some

Three factors enter into the cooling of the water

I. Radiation from the sides of the tower
II. Contact of the cool air blown through the tower
III. Evaporation.

Evaporation is the most important of the three, as the evaporation of one pound of water in this way carries off 1,000 heat units, and condenses one pound of steam in the condenser

Considerable cooling is done by radiation and contact of the cool air blown through the tower, so that the evaporation will be less than the amount of steam condensed in the condenser, and so the supply of extra water is not needed.

The cooled water is collected at the bottom of the tower, and ready once more to serve as injection water to the condenser. An overflow pipe is provided to carry off oil that collects

The floor space occupied by the tower is not excessive. A 1,000 horse-power plant will require a tower 17 feet in diameter by 30 feet high. The collecting tank at the bottom of the tower is about 8 feet in diameter by 7 feet deep, and holds about 2,000 gallons of water, which is sufficient to start the plant.

The power to run the fan will be 2 per cent and under of the power of the engine, and may be operated by electricity, shaft and belting, or a small independent steam engine, as may be most desirable.

In some experiments made by Mr. Alberger, the temperature of the cooled water, observed under different ranges of temperature of the air are as follows:

Temp of Air	Aver Temp of Cooled Water.	Difference between Air and Cooled Water.
20° F	45° F	25° F.
30	50	20
40	56	16
50	62	12
60	70	10
70	78	8
80	87	7
90	97	7
95	100	5

"It will be noticed that, as the temperature of the air increases, the temperature of the cooled water becomes nearer that of the former. With the temperature at 20 degrees Fahr. there is a difference of 25 degrees, and at 95 degrees Fahr., the difference is only 5 degrees, when circulating practically the same volume of air, and carrying off the same amount of heat, the circulation of the water having been reduced as the temperature is lowered. This shows plainly the activeness of the evaporation at the higher temperatures, when the air has a largely increased capacity for moisture."

In this high altitude, (Colorado) where the air is almost always very dry, its capacity for absorbing moisture is extremely large. The result would indicate a better showing than indicated by the above table.

Of a large plant, in which this system of using the water over and over again has been in constant use since 1895, some figures will be of interest.

The cooling tower was placed in the yard

back of the plant about 60 feet from the condenser. Compound engines with a total of 750 H. P. were employed, and during the hot months a vacuum of 24 and 26 inches was easily maintained. The cooling tower is 15 feet in diameter by [illegible] feet high. The circulating water amounts to [illegible] gallons per minute, and the [illegible] cubic feet of air per minute. The whole system contains about 2,000 gallons of water. The temperature of the tank water [illegible] to [illegible] Fahr. The water to be distributed in the cooling tower comes in at 110 to 115 Fahr.

I have worked up some data given by Mr. Alberger in reference to this system employed by [illegible] manufacturing concern.

The engine is a cross compound Harris-Corliss, having a [illegible] high pressure steam cylinder and a [illegible] inch low pressure steam cylinder, making [illegible] revolutions per minute with 100 pounds boiler pressure.

The engine running non-condensing gave the cards showing the following:

The horse power of the high pressure cylinder was 100,[illegible] and that of the low pressure cylinder was [illegible], giving a total of 175.2 H. P. when running non-condensing.

The average mean effective pressure of the high pressure cylinder was 36 pounds, and that of the low pressure cylinder was 6.375 pounds.

In 1895 this engine was changed from running non-condensing to condensing. A condenser was put in, and the cooling tower was placed some [illegible] feet from the condenser, the circulating fan being run by an extension of the shafting from the factory. The speed of the fan could be regulated to suit the conditions of the weather, or could be stopped at any time.

* * * * *

In running non-condensing the steam was admitted for 15 inches of the stroke, while condensing it was admitted but 9 inches, showing a saving of 6 inches, or a saving of 40 per cent roughly. Cylinder condensation was slightly increased on account of terminal pressure from 2[illegible] to [illegible] pounds.

The fan consumed about 2 per cent of the power under the most severe conditions. The air pump consumed 5.7 H. P., or less than 3 per cent of the total H. P. of the main engine. The total of 5 per cent, subtracted from the gross saving, leaves 35 per cent, or an extremely good showing for condensation by this system.

Cards taken while the engine was running non-condensing show that the high pressure cylinder developed 1[illegible] indicated horse power, and the low pressure cylinder [illegible] indicated horse power, or a total of 1[illegible] as 175.2 indicated horse power non-condensing.

In both cases the engine, aside from condensing, was operated under the same conditions of pressure and speed.

The difference, then, of 20.[illegible] horse power, in favor of condensing, shows an advantage of nearly 1[illegible] per cent in power. As the number of cards I had was limited, and more and better cards might have shown an even better percentage of gain by this condensing system. Even 12 per cent would, in my judgment, warrant the introduction of this condensing system.

The gain of 35 per cent net, as shown by Mr. Alberger, relates of course to the *steam* saving, while the 12 per cent saving in *power*, as shown by my figures, results in *more power on less steam*.

Mr. J. H. Vail, Engineer in Chief of the Penn Light, Heat & Power Co., of Philadelphia, in his paper on "Cooling Tower and Condenser Installation," describes the installation of this system of condensation.

The plant in question was equipped with 27 boilers, each [illegible] inches in diameter, 20 feet long, with twenty-two [illegible] inch tubes. The engine capacity of the [illegible] in the station taxed all the boilers to the limit of their steaming capacity.

It was first proposed to enlarge the building and increase the number of boilers, but after an investigation by Mr. Vail it was decided to put in a cooling tower instead of boilers, leaving the boiler capacity as it was, thus saving the cost of additional boilers, besides the building, and obtaining a better economy, and at the same time greater capacity for production.

Latest Mining Decisions.

Prepared by Andrews A. Murdoch, Berrien Springs, Mich.

A temporary injunction against the removal of ore from the mining land of a complainant will not be dissolved because of defendant's solvency. Mabel Min. Co. vs. Pearson Coal and Iron Co., 25 So. Rep. (Ala.) 754.

A mine owner is liable for the death of an employe caused by the superintendent's failure to do what due diligence required of him, because he was acting under excitement. Bessemer Land and Improvement Co. vs. Campbell, 25 So. Rep. (Ala.) 793.

A mine superintendent will be presumed to have authority to purchase all appliances necessary to extinguish a fire to save the life of an employe, in the absence of evidence to the contrary. Bessemer Land and Improvement Co. vs. Campbell, 25 So. Rep. (Ala.) 793.

An employer's failure to use due diligence in rescuing an employe while in a mine in which a fire is started is not excused by his acting pursuant to the unanimous opinion of other operatives. Bessemer Land and Improvement Co. vs. Campbell, 25 So. Rep. (Ala.) 793.

An employe placed in imminent peril is not guilty of contributory negligence precluding a recovery for his employer's negligently causing his death by mistakenly failing to avail himself of a means of escape, where he acted as a man of ordinary care would have done under the circumstances. Bessemer Land and Improvement Co. vs. Campbell, 25 So. Rep. (Ala.) 793.

In an action for causing an employe's death by suffocation in a mine, an allegation that the superintendent negligently failed to take due and proper precautions to prevent a fire from causing the suffocation is a sufficient allegation of negligence, as an averment of special negligence is not required. Bessemer Land and Improvement Co. vs. Campbell, 25 So. Rep. (Ala.) 793.

Where a fire is raging in the middle of a mine, while an employe is below the fire, it is the mine owner's duty to telegraph to a distant city and hire a special train to obtain appliances with which to extinguish the fire, if such is the only means of saving the employe's life, as the rule of diligence, when life is at stake, requires the doing of everything that gives reasonable promise of its preservation, regardless of difficulties and expense. Bessemer Land and Improvement Co. vs. Campbell, 25 So. Rep. (Ala.) 793.

In an action for causing the death of a mine employe through the employer's failure to extinguish a fire by water, while the employe was 300 feet below the fire, evidence that several months previously a pipe line to [illegible] had been laid is admissible to show the feasibility of getting water through that line, [illegible] still existed, even though it [illegible] had not been taken up, to [illegible] extinguish the fire before the employe [illegible]. Bessemer Land and Improvement Co. vs. Campbell, 25 So. Rep. (Ala.) 793.

In an action for causing the suffocation of an employe who [illegible] in a mine, by the fire [illegible] a slope, and [illegible] there was evidence that the employe could have lived a few days until the employer could have procured appliances for extinguishing the fire with water, *Held*, that a witness' testimony that he was satisfied that [illegible], and the testimony of the superintendent that at the time he [illegible] the [illegible] he could have done to save the employe, were properly rejected as being mere conclusions. Bessemer Land and Improvement Co. vs. Campbell, 25 So. Rep. (Ala.) 793.

A fire originated in the middle of a mine, and volumes of smoke rose from the air shaft. A short time thereafter men passed up a slope parallel with the air shaft without much difficulty with smoke, until they reached a point opposite the fire. There were no appliances at hand for extinguishing the fire by water, but they could have been obtained in a few days by telegraphing. One at the bottom of the mine, 400 feet below the fire, could have lived several days while the fire was raging. It had originated in the air shaft, and had quickly penetrated to the slope, and the air shaft was large enough to carry the smoke and gases as rapidly as they were generated. The mine superintendent smothered the fire by sealing up the air shaft and slope, and an employe who was below the fire was suffocated. *Held*, a question for the jury whether the superintendent was guilty of negligence justifying a recovery. Bessemer Land and Improvement Company vs. Campbell, 25 So. Rep. (Ala.) 793.

PERSONAL NEWS ITEMS

[illegible]

[illegible]

R. H. [illegible] of San Francisco [illegible]

[illegible] has recently [illegible] property in the vicinity [illegible] $[illegible]

JAS. [illegible] has been appointed superintendent of the Mono [illegible]

WM. [illegible] is [illegible] New York, where he went to [illegible] for the sale of the [illegible] mine.

MAJOR J. E. JACKSON, who [illegible] time [illegible] has been [illegible] Reduction Co. at [illegible], has recently been appointed manager of the Mexican Ore Co., with headquarters [illegible] Mexico.

W. H. HENRY [illegible] and [illegible] T. STEVENSON, of Grants Pass, Oregon, recently left that place on a business trip through California.

CAPT. DELAMAR and JOHN HAYS HAMMOND are expected in California next week.

The Mining and Metallurgical Journal

THE MARKETS.

All quotations, financial reports and other statistical figures given are the latest New York Quotations, unless otherwise stated in each item. [illegible] of [illegible] other matter.

New York, July 29th, 1899.

The following are the Silver, Copper and Lead quotations for the last two weeks:

		SILVER.	COPPER.	LEAD.
July	17	60¾	18 50	4 35
"	18	[illegible]	18 [illegible]	4 [illegible]
"	1[illegible]	60⅝	18 50	4 35
"	20	60⅝	18 50	4 35
"	21	60⅜	18 50	4 35
"	[illegible]	60⅜	18 50	4 35
"	24	60⅜	18 50	4 35
"	25	60¾	18 50	4 35
"	26	60⅝	18 50	4 35
"	[illegible]	60⅝	18 50	4 [illegible]
"	28	60⅝	18 50	4 35
"	29	60¾	18 50	4 35

SILVER.

The silver market has ruled dull, but the reports of the shutting down of the Colorado smelter, on account of the labor strikes, silver closes higher and stronger, and the possibility of lessened supplies may affect the London market.

COPPER.

The copper market continues quiet. The buyers are covered and not inclined to purchase, while no pressure to sell is observable. Lake copper is offered at 18c., but a few transactions are reported at 17⅞. Very little is doing in electrolytic copper, the quotation is still 16⅞c. for cakes, wirebars or ingots, and 16[illegible]c. for cathodes, while casting copper is nominal at 16¾c. and 16⅞c.

LEAD.

There is an accumulation [illegible] in New York City, and [illegible] 4.42½ @ 4.45c. The London market is unchanged, Spanish lead being quoted at £14 3s. 9d. @ £14 5s. and English at £14 8s. 9d.

SPELTER.

[illegible] prices declined further. Spelter is quoted at 6c. New York [illegible] London being quoted at [illegible] spot [illegible].

ANTIMONY.

Antimony continues in good demand with prices unchanged at 10[illegible] for Cookson's, 10c. for Hallett's [illegible] Star and Hungarian.

NICKEL.

Nickel continues unchanged and no alteration of prices can be reported. We quote for ton lots 33@30c. per lb., and for smaller orders 35½@38c. London prices are 14@16d. per lb., according to size of order.

TIN.

The market has moved but sluggishly, and prices have changed little. The London market is quoted in closing at £116 12s. 6d. @ £116 15s. for spot and 17s. 6d. higher for three months. New York is quoted at [illegible].

PLATINUM.

The demand for Platinum is active and prices continue high. We quote for New York $15.50 per ounce for large lots and $16@17 for small orders; London is 62@64 an ounce.

POTASSIUM CYANIDE.

Purified, 98@99 per cent., in cases of 120 lb. at 30c. per lb. in 5, 10, 25 and 50 lb. tins at an advance.

QUICKSILVER.

The New York quotation remains $42 per flask. The London price has advanced to £8 [illegible] with £8 4s. quoted for second hands.

POWDER.

F. o. b., San Francisco: No. 1, 70 per cent. nitro-glycerine per lb, in carload lots, 15¼c.; less than one ton, 17¼c. Black blasting powder in carload lots minimum car, 728 kegs, $1 50 per keg; less car lots, $2 per keg.

COKE.

There has been a quiet trade in coke with a slight improvement reported.

IN CAR LOTS, ST. LOUIS.

Connellsville fdy coke 72-hr. frv....$4 70
New River, $4 00 Pocahontas... 3.90
Crushed.......... 4.70
Gas works coke, lump, per bushel.. .10

BORAX.

The San Francisco market in Borax is firm with a good demand, powdered refined in car lots 7¼c.

THE MINOR METALS.

Quotations are given below for New York delivery:

Aluminum:	
No. 1, 99 per cent. ingots, per lb.	35@37c
No. 2 [illegible]	[illegible]@34c
Rolled sheets, per lb	35c up
Aluminum-Nickel per lb	[illegible]
Alum bronze	[illegible]
Bismuth, per lb	$1 45@$1 50
Phosphorus, per lb	45@50c
M[illegible]	$ [illegible]
Tungsten, per lb	70c
Ferro-tungsten, 50 per cent	60c

Variations in price depend chiefly on the size of the order.

CHEMICALS

The market is bare of domestic goods, while for foreign alkali the demand is slow, owing to the high price.

Caustic soda is quoted for high test, per 100 lbs., f. o. b., works $1 [illegible] @ $1 45. New York $1 66 @ $1 67. Foreign high test is quoted in New York at $1 [illegible] @ to $1 70. Jobbers have made sales of domestic alkali around 85c. per 100 lbs. We quote domestic alkali in bags, per 100 lbs. f. o. b., works, at 62½ @ [illegible]. In New York 80 @ 85c. Foreign quoted in New York at 75 @ 80c., per 100 lbs.

Sal-soda is quoted at 50c. per 100 lbs., works. 60 @ 62½c. is offered in New York for foreign. Bi-carbonate of soda is quoted at $1 12½ @ $1 25, and for extr. $3 25 @ 3 50 per 100 lbs., works, with $2 12½ @ $2 25 offered for foreign. Chlorate of potash, we quote for crystals, domestic $8 00 @ $9 25, and for powdered $9 50 @ $9 75. Foreign chlorate of potash is quoted in New York, for crystals, $9 25 @ $9 50, and for powdered $10.00 @ 10 25.

CHLORIDE OF LIME.

English prime brands $1 60@$1 70. American, $1 70@$1 80, Continental P $1 50@$1.60 per 100 lbs.

ACIDS

Sulphuric acid is in better request owing to the warm weather, but blue vitriol is quiet. The other acids are featureless.

BRIMSTONE.

Brimstone is quiet, with no arrivals. We quote for spot, best unmixed seconds $21 75 @ $22 00 per ton, shipment, $20 50 @ $20 75. Best thirds are about $2 less per ton.

NITRATE OF SODA.

Spot is quoted firmer at $1 82½ @ $1 65 per 100 lbs, and futures at $1 60. Consumers, however, anticipate a lower market, as the quiet season is at hand, but the importers are of a different opinion and do not seem anxious to sell futures at present. 18,000 bags are now due in New York.

FINANCIAL NOTES.

Average Prices of Metals

in New York per 100 lbs. from January 1st, 1899.

Month	Copper	Tin	Lead	Spelter
January	14.75	22.48	4.18	5.34
February	18.50	24.20	4.49	6.38
March	[illegible]	[illegible]	[illegible]	[illegible]
April	[illegible]	[illegible]	[illegible]	[illegible]
May	18.45	25.74	4.44	6.88
June				
July				
August				
September				
October				
November				
December				
Average				

Average Monthly Prices of Silver,

in New York per ounce Troy, from January 1st, 1899, and for the years 1898 and 1897.

Month	1899	1898	1897
	Cents	Cents	Cents
January	[illegible]	[illegible]	[illegible]
February	[illegible]	[illegible]	[illegible]
March	[illegible]	[illegible]	[illegible]
April	[illegible]	[illegible]	[illegible]
May	[illegible]	[illegible]	[illegible]
June		[illegible]	[illegible]
July		[illegible]	[illegible]
August		[illegible]	[illegible]
September		[illegible]	[illegible]
October		[illegible]	[illegible]
November		[illegible]	[illegible]
December		[illegible]	[illegible]
Year		[illegible] 26	[illegible] 79

Comparative statement of the circulation in the United States on June 1st 1899. Comparison being made with statement on May 1st, 1899.

	June 1.	Changes.
Gold	$724,[illegible]	I. $[illegible]
Silver	132,479,197	D. 338,[illegible]
Legal Tenders	311,095,424	D. 961,981
Treasury Notes	[illegible]	D. [illegible]
Totals	$1,[illegible]	I. $[illegible]

Gold and Silver certificates and currency are not included in this table. By adding the amounts given in this table with those in the following will give the total amount coined or issued. The figures herewith are furnished by the Bureau of Statistics Treasury Department.

Comparative statement of changes of money in United States Treasury during June 1st 1899, comparison being made with statement, on May 1st, 1899

	June 1.	Changes.
Gold	$[illegible]	D. $[illegible]
Silver	[illegible]	I. [illegible]
Legal Tenders	[illegible]	I. [illegible]
Treasury and Bank Notes	4,051,[illegible]	I. [illegible]
Totals	$[illegible]	D. [illegible]

The Gold and Silver bullion on hand in the Treasury is not included in this statement.

Gold and Silver Exports and Imports

At all United States ports, for the month of May, 1899, and eleven months ending May, 1898, and 1899

MAY	1898	1899
Gold		
Exports	$[illegible]	$[illegible]
Imports	[illegible]	[illegible]
Excess	I. $[illegible]	I. $[illegible]
Silver		
Exports	$4,[illegible]	$[illegible]
Imports	[illegible]	[illegible]
Excess	E. $[illegible]	E. $[illegible]

ELEVEN MONTHS ENDING MAY	1898	1899
Gold—		
Exports	$15,030,663	$[illegible]
Imports	117,061,063	[illegible]
Excess	I. $102,030,[illegible]	I. $[illegible]
Silver—		
Exports	$[illegible]	$[illegible]
Imports	[illegible]	[illegible]
Excess	E. $[illegible]	E. $[illegible]

This statement includes the exports and imports at all United States ports, the figures being furnished by the Bureau of Statistics of the Treasury Department.

WANTS

Advertisements of this class containing not more than five lines will be inserted for not exceeding three months free of charge. Other than above $1.00 per [illegible]. Advertisements not accepted for less than one month.

COPPER MINE. State full particulars in regard to development work location, distance from water, price of fuel, character of ore and returns from shipments. Must have at least 1500 feet of development work. Send all information possible. Address,

JAMES HOWARD,
Care JOURNAL Office,
150 Nassau St., New York, N. Y.

GOLD mine anywhere in *United States*, must have at least 1000 feet of *development*; where coal is *not over* $6.00 per ton or wood $4.00 per cord *delivered; plenty of water;* no objection to *low grade* ore if profit can be made by having *large plant to amalgamate* and *concentrate;* want 6 months working *bond;* no *property* considered unless *owners* are prepared to deposit *certified check* for expenses of *engineer* if *property is not as represented* Address with *price* and *full paticulars*

J. E. M., Journal Office,
150 Nassau Street, New York, N. Y.

METALLURGIST and Chemist, ten years experience, assaying, ore buying and smelting, at present engaged with large pyritic smelting company in Mexico, desires engagement in the States or British Columbia
Address: "W. H. C." JOURNAL Office.

NOTICE TO STEAM USERS.

The National Association of Stationary Engineers is prepared to furnish Engineers of guaranteed ability for any plant in the city or elsewhere. Give us a call
Address J. T. CHAMBERS, Sec'y,
Engine Room City Hall
Tel Main 567. Los Angeles, Cal

METALLURGIST and experienced Assayer and Chemist with practical experience in [illegible] position. Speaks Spanish, highest references, address "Globe", JOURNAL office

EXPERIENCED man desires position who can install, run and keep in repair, steam, electrical and Mining machinery, has knowledge of assaying and office Work. References. Address
W. H. K., McCLOUD, CAL.

FOR SALE

A GROUP of 4 Copper claims in Northern Arizona. By-product of gold and silver, recently discovered and show great promise will sell at a great bargain.
[illegible]
DEWEY, ARIZ.

TREMAIN Two Stamp Steam Mill at Tucson, Arizona. 15-H. P. Boiler Pump and every thing complete, set up ready for work. In excellent condition, used less than six months. Address DENDOING MINING MACHINERY CO.
Kansas City, Mo

ANTIMONY BISMUTH

PROSPECTORS having locations of this nature and wishing to sell at once for cash, will do well to address with full particulars,
P. O. Box 2075
SAN FRANCISCO, CAL.

A VERY valuable, extensive Lead Mining Property in Southwest Virginia. Shafts sunk over 200 feet and actual work has demonstrated richness of veins and purity of ore.
Address: GEORGE FRANKE.
Baltimore, Md

FOR SALE AT A BARGAIN.

A 60-TON copper smelting Plant, consisting of two 30-ton furnaces, one of which has new, seamless liner. Plant is complete in every detail. Also an 80-ton Silver-Lead Furnace, entirely new, never having been set up. All of the above located immediately adjacent to railroad. Enquire of GARDINER, WORTHEN & GOSS, dealers in Mining and Mill Supplies, Tucson, A. T.

See Mining Stock Quotations Page 21

MINING STOCK QUOTATIONS

BOSTON

Adventure	10 00	Mass	11 00
[illegible]	1 00	[illegible]	1 00
[illegible]	8 50	[illegible]	28 00
[illegible]	50 63	[illegible]	1 25
Arcadian	56 00	[illegible]	13 25
[illegible]	13 50	Old Dominion	37 00
[illegible]	32 00	[illegible]	88 75
[illegible]	31 00	[illegible]	57 50
Bingham	7 50	[illegible]	2 50
Bonanza	2 50	[illegible]	50 00
Boston & Montana	250 00	Rhode Island	7 25
[illegible]	00	Santa Fe	11 37½
Butte & Boston	00	[illegible]	14 25
Calumet & Hecla	780 00	Tamarack	200 00
[illegible]	15	Tecumseh	5 25
Centennial	31 37½	[illegible]	10 50
Cochiti	17 00	[illegible]	3 50
Copper Range	45 00	Victoria	5 50
[illegible]	30	United States	21 00
Dominion Coal pfd	116 50	Utah Mining	17 75
Franklin	18 50	[illegible]	7 25
[illegible]	31 50	[illegible]	11 50
[illegible]	2 75	Winona	13 50
Isle Royale	46 00	Wolverine	45 50
[illegible]	4 00	Wyandotte	5 50

ROSSLAND, BRITISH COLUMBIA.

[illegible]	30	Kootenay Gold F[illegible]	
[illegible]	6 25	[illegible]	
Brit Col Cor	5 00	Lily May	—
[illegible]	60	[illegible]	
Cariboo	1 30	[illegible]	1 00
Commander	—	Monte Cristo	—
Deer Park	—	New G'd F'lds B.C.	5 00
Dundee	23	Novelty	—
Evening Star	12	Queen Bess Prop	3 75
[illegible]	50	[illegible]	35
[illegible]	6 00	Red Mount'n View	
[illegible]		[illegible]	
Hall Mines	2 75	Silver Bell	
Homestake	05	Silver Queen	16
Iron Horse	12	St Elmo	—
Iron Mask	75	[illegible] Star	
Josie		[illegible]	
Jumbo	—	Waverly Mines	20
[illegible]	—	War Eagle Con	3 75
Keystone	—	White Bear	16

SAN FRANCISCO

Alta Con	04	Mexican	41
Andes	11	Occidental	25
Belcher	34	Ophir	1 95
Best & Belcher	45	Overman	17
Bullion	06	Ontario	—
Caledonia	67	Plymouth	—
Challenge	35	Potosi	28
Chollar	25	Quicksilver	—
Confidence	1 00	Quicksilver prefd	—
Con. Cal & Va	1 60	Savage	24
Crown Point	22	Seg Belcher	07
Deadwood		Sierra Nevada	68
Gould & Curry	25	Silver Hill	03
Hale & Norcross	24	Standard	3 40
Homestake	—	Union Con	37
[illegible]		Utah	14
Justice	17	Yellow Jacket	30

COLORADO SPRINGS STOCKS

Acacia	06¾	Hayden	01½
Alamo	07½	Ingham Con	08½
Altamont	—	Isabella	79¼
American Con	03¼	Jack Pot	39½
[illegible]	45	Kimberly	08
Aola	03½	Lexington	—
Arcadia Cons	—	Magnet Rock	09¼
Argentum Juniata	16	Matoa	13¼
[illegible]		[illegible]	
[illegible]	01	Mountain Beauty	04
[illegible]	03½	[illegible]	26
Creede & C. C.	09	Moon-Anchor	60
Cripple Cr'k Con	08½	Mount Rosa	30
Dante	10¾	New Haven	03¼
[illegible]	02½	[illegible]	01
[illegible]	07	[illegible]	07
El Paso	18½	Pharmacist	04
Emma Alimee	01	Pilgrim	04½
[illegible]	0035	Portland	1 71
[illegible]		Pt. Alert	02½
[illegible]	11	[illegible]	02½
[illegible]	02	[illegible]	06½
Golden Fleece	31	[illegible]	07½
[illegible]	04	Trachyte	04
Gold King	65	Union	10¾
[illegible]	17½	Vindicator	
Granite Hill	—	Work	17

SALT LAKE CITY

Alice	68	Joe Bowers	18
Ajax	1 20	[illegible]	07½
Alliance	05	La Reine	98
Anchor	10	Little Pittsburg	01¾
Buckeye	02½	Lower Mammoth	41
[illegible]	6 75	May Day	85
Cent. Eureka	51 00	Mammoth	1 75½
Chloride Point	78	Mercur	5 00½
Daisy	30¼	Northern Light	65¾
Dalton	01½	Omaha	25¾
Dalton & Lark	08¼	Ontario	7 25
Daly	1 80	Petro	79
Daly West	12 10	Rich Anaconda	10
Dexter	2 00	Sacramento	45
Eagle	05	Shower Con	37
Eagle & Blue Bell	1 27	Silver King	40 25
[illegible]	03	Star Consolidated	35½
Four Aces	20	Sunbeam	47
Galena	21	Sunshine	60
Geyser-Marion	18¼	Swansea	3 82½
Golden Eagle	03	So. Swansea	1 65
Grand Central	2 85	Tetro	08½
Homestake	08¾	Utah	60
Horn Silver	1 35	Valeo	31
Ingot	15	West M'n Placer	25

NEW YORK

Adams Con	18	Isabella	60
Alamo	07	[illegible]	56
Alice	76	Jefferson	07
Alliance		Jennie Blanche	61¾
Anaconda	50 00	Justine	02
Anaconda Gold	60	King & Pemb	13
Anchoria L.	08¾	Leadville Cons	09
[illegible]	25	[illegible]	17
[illegible]	38	Mexican	45
Best & Belcher	60	Mollie Gibson	24
Bull (Gold)	—	Mt. Rosa	10½
Breece	1 00	Occidental	26
Brunswick	15	Ontario	8 00
Chollar	21	Ophir	1 00
Cheyenne	00	Pharmacist	06
Comstock Tunnel	—	Phoenix	10
Comstock Bonds	04	Plymouth	08
Comstock Script	00	Portland	1 00
Con Cal & Va	1 70	[illegible]	33
Cr. & Cr. Creek	09	Quicksilver	2 75
Crescent	15	Quicksilver pfd	8 13
Crown Point	30	Rocky Mt [illegible]	
Cripple Creek Con	10	San Juan Star	
[illegible]	60	Savage	20
Elkton Cons	55	Sierra Nevada	65
[illegible]	30	Small Hope	1 25
Good Samaritan	—	Specimen	07
Gold Coin C. Cr'k	1 95	Standard Con	2 25
[illegible]	55	[illegible]	
[illegible]	38	[illegible]	55
Gould & Curry	25	[illegible]	18
Gregory Gold	02¾	Utah Con	10
Hale & Norcross	42	[illegible]	
[illegible]	24	[illegible]	
Homestake	50 00	Work	17
Horn Silver	1 60	Yellow Jacket	38

SPOKANE, WASHINGTON.

Cariboo	1 25	Mountain Lion	1 27
Ben Hur	15	Morrison	16
[illegible]	22½	Noble Five	12
[illegible]	05	[illegible]	14
Butte and Boston	17	[illegible]	12
Deer Trail No. 2	28½	Pocahontas	04
Hardman	03	Princess Maude	08
Eureka First Th'l	06	Quilp	12
Eureka Queen	08½	Rebate	20
Golden Harvest	07½	Republic	1 25
Gold Leaf	05	Republic Big Six	09½
Insurgent	08½	Republic No. 2	08½
Iron Monitor	08¾	[illegible]	02
Jim Blaine	28	Surprise	12
Liberty	04	Thoughtful	07
Lone Pine Cons	23	Tom Thumb	15
Merrimac	09½	Trade Dollar	15
Monroe	08	Treasury	05
Morning Glory	16	Winipeg	33

DENVER STOCK REPORT

Aetna	—	Keystone	07½
Anchoria Leland	33½	Lillie	
Anaconda	48 00	Matoa	21½
Arcadia	03½	Mollie Gibson	25
Argentum Juniata	25	Moon Anchor	30
Banner	01¾	Mt. Rosa	20
[illegible]	03	[illegible]	01½
[illegible]	82	[illegible]	
[illegible]	37	[illegible]	
[illegible]	0	[illegible]	
Fanny R	0035	[illegible]	1 28½
[illegible]	10½	[illegible]	02½
Geo. Washington	—	[illegible]	04
Golden Eagle	35	[illegible]	04
[illegible]	1 11	[illegible]	
[illegible]		[illegible]	06
Gilpin Road	—	Tamarack	08
Golden Fleece	31	Union	10¾
Isabella	14	Virginia M	04
Iron Clad	08½	Wheels Cons	—
Jack Pot	39¼	Work	13

MEXICO

Name of Company	State	Price
[illegible]	Hidalgo	31
[illegible]	Guanajuato	370
Arevalo y Anexas	Hidalgo	200
Asturiana y Anexas	Zacatecas	60
[illegible]	[illegible]	40
[illegible]	Hidalgo	70
[illegible]	Zacatecas	16
Candelaria de Pinos		90
[illegible]	[illegible]	30
Carmen	Hidalgo	485
Cinco Señores y An	Guanajuato	320
Concepcion y Anexas	[illegible]	100
[illegible]	Mex	75
El Oro	Guanajuato	30
El Oro, pref.	Guanajuato	30
Esperanza y An.	Mexico	1 350
Gloria	Chihuahua	60
[illegible]	Guanajuato	50
[illegible]	Michoacan	72
[illegible]	Michoacan	20
[illegible] de Maravillas	Hidalgo	100
Pabellon		20
Palmas de Somb	Zacatecas	80
[illegible]	Durango	2 000
Rafael y Anexas	Hidalgo	1 000
Real del Monte	Hidalgo	750
Restauradora	Durango	20
Rosario y Anexas	Durango	10
San Francisco	Hidalgo	180
San Rafael avíado	Hidalgo	420
San Rafael del Oro	Hidalgo	05
Sta. Maria de la Paz	S. Luis Potosi	720
Soledad	Hidalgo	370
Sorpresa		240
Trinidad Aviador	Guanajuato	125
Trinidad Aviado	Guanajuato	110
Tlauzingo	Puebla	28
[illegible]	Hidalgo	380
Zona Min. de Paz	Guanajuato	57

NOTE. The above Mexican stocks are figured on the basis of Mexican silver

INCORPORATED MINES PAYING DIVIDENDS.

	NAMES OF MINES	LOCATION	No. of Shares	Capital Stock	Par Value	Amount of last Dividend	Date of Last Dividend	Total Amount Paid in Dividends	Kind of Mines Produced
1	Aetna Cons.	California	100 000	$ 500,000	$ 5	$ 10	Apr 1898	$ 170 000	L
2	Alamo	Utah	125 000	125,000	1	02	April 1899	2,500	G
3	Alaska, Treadwell	Alaska	200,000	5,000,000	25	37½	Apr 1899	4,670 000	G
4	Alaska Mexican	Alaska	200 000	1,000,000	5	10	Apr 1899	358 081	G
5	Anaconda	Montana	1,200 000	30,000,000	25	1 25	May 1899	0,750,000	C.
6	Anderson Leland	Colorado	600 000	600,000	1	03	Apr 1899	198 000	G.
7	American Gold	Colorado	300 000	3,000 000	10	09	Mar 1899	407,000	G. S.
8	Argonaut	California	200 000	2 000 000	10	10	April 1899	200 00	
9	Associated	Colorado	1,250,000	1,250 000	1	01	Dec 1898	72 000	G
10	Bi l Butte	Montana	250 000	250,000	1	05	May 1899	70.. 38	G. S
11	Boston & California	California	600 000	600 000	1	05	March 1899	30 000	
12	Boston and Colorado Smelting	Colorado	15,000	750 000	50	5 00	April 1899	275 000	
13	Boston & Montana	Montana	150,000	3,750,000	25	6 00	May 1899	10 77. 000	G, C, S
14	Breece	Colorado	200 000	5,000 000	25	05	June 1899	50 000	L
15	Bullion Beck and Champion	Utah	100 000	1 000 000	10	10	May 1899	2,558 000	G, S
16	Bunker Hill and Sullivan	Idaho	300,000	3,000 000	10	07	May 1899	705 000	S, L
17	Cariboo	British Col	800,000	$ 800 000	1	01½	Feb 1899	248 965	G
18	Calumet & Hecla	Michigan	10,000	2,500,000	25	20 00	June 1899	62,850 000	C
19	Centennial Eureka	Utah	30 000	1 500 000	50	50	May 1899	2 105 000	S, L
20	Central Lead	Missouri	10,000	1,000,000	100	50	June 1899	412 000	L
21	Charleston	S. Carolina	10,000	1,000,000	100	2 00	June 1899	200,000	
22	Colorado Smelting	Montana	100,000	1 000 000	10	1 00	Jan 1899	1 945 000	G, S, C
23	Consolidated Tiger and Poorman	Idaho	1,000 000	1,000,000	1	02	Dec 1898	20,000	G, S
24	Creston Leasing	Colorado	1 000 000	1,000 000	1	01	Dec 1898	54, 00	
25	Crowned King	Arizona	600,000	6,000 000	10	02	Dec 1898	232,000	G S L
26	De Lamar	Idaho	4 0,000	2,000 000	5	12	May 1899	2,346 000	G, S
27	Deer Trail No 2	Washington	1 000,000	1,000 000	1	0025	May 1899	30 000	
28	Doe Run	Missouri	5,000	500 000	100	50	June 1899	7 > 000	L
29	Elkton Consolidated	Colorado	1,250,000	1,250,000	1	01½	Nov 1898	668,961	G, S
30	Empire State	Idaho	75 000	750 000	10	20	June 1899	105 638	
31	Enterprise	Colorado	500 000	500 000	1	05	Sept 1898	300,000	S L
32	Funny Rawlings	Colorado	1 000,000	1,000,000	1	01	May 1899	10 000	G S
33	Ferris Haggerty	Wyoming	1 000 000	1 000 000	1	00½	Mar 1899	5 000	C, G, S
34	Geyser-Marion	Utah	300 000	3 500 000	5	02	Sept 1898	9> 000	G
35	Garfield Consolidated	Colorado	1,200 000	1,200 000	1	01	May 1899	34 000	G
36	Golden Star	Ontario, Canada	100,000	100 000	1	01	July 1899	41 000	
37	Gold Coin of Victor	Colorado	1 000 000	1 000,000	1	01	May 1899	200 000	G
38	Gold King	Colorado	1 000 000	1,000 000	1	02	May 1899	10 000	G.
39	Golden Cycle	Colorado	200,000	1 000 000	5	05	June 1899	108 500	
40	Grand Central	Utah	250 000	250,000	1	15	May 1899	493,750	G, S, C, L
41	Gwin	California	20,000	1,000 000	50	25	May 1899	66,500	G.
42	Highland	S. Dakota	100,000	10,000,000	100	20	May 1899	3,834,718	G.
43	Holy Terror	S Dakota	300,000	300,000	1	01	Mar 1899	122,000	G
44	Homestake	S. Dakota	125,000	12,500 000	100	50	May 1899	7,493 750	G.
45	Horn Silver	Utah	400,000	10 000,000	25	05	April 1899	5 260 000	S, L
46	Idaho	British Col	500,000	500 000	1	05½	Jan 1899	202 000	
47	Isabella	Colorado	2 250 000	2,250,000	1	06	Feb 1899	405,000	G
48	Jack Pot	Colorado	1,000,000	1,000,000	1	02½	Mar 1899	25,000	G.
49	Jamison	California	300,000	3,000,000	10	10	April 1899	50 700	
50	Lake Superior Iron	Michigan	84 000	2,100 000	25	1 00	Feb 1899	736,000	I
51	Lillie	Colorado	1,000,000	1,000,000	1	05	June 1899	224,110	G.
52	Modoc	Colorado	500,000	500,000	1	02	May 1899	130,000	G
53	Montana Ltd	Montana	660,000	3 300 000	5	12	Apr 1899	2,097 557	G, S.
54	Montana Ore Purchasing	Montana	40,000	1,000 000	25	1 00	May 1899	1,120,000	
55	Morning Star	California	2,400	240 000	100	2 50	May 1899	726,600	G.
56	Mercur	Utah	200 000	5,000 000	25	12½	Jan 1899	1,260,000	G
57	Mammoth	Utah	400 000	10,000,000	25	05	Dec 1898	1,350,000	G, S, C, L.
58	Matoa	Colorado	1,000 000	1 000,000	1	02½	Dec 1898	25,000	G.
59	Mead	California	2,000,000	2,000 000	1	20	Mar 1899	100,000	G.
60	Monument	Colorado	800,000	800,000	1	01	Dec 1898	12 624	
61	Moulton	Montana	400 000	2 000 000	5	05	Feb 1899	480 000	
62	Mt. Shasta	California	20 000	100 000	5	30	May 1899	6,000	
63	New York & Hon. Rosario	Central A	150,000	1,500 000	10	10	May 1899	1,050.000	S, G
64	Napa	California	100 000	700 000	7	20	Apr 1899	990,000	Q.
65	New Idria Quicksilver	California	100,000	500 000	5	20	Apr 1899	120,000	Q.
66	North Star	California	200,000	2,000 000	10	25	Apr 1899	550 000	G.
67	Ophir Hill	Utah	1.000	25,000	25	20 00	Dec 1898	20,000	
68	Original Empire	California	50,000	5,000,000	100	1 00	May 1899	500 000	G.
69	Osceola	Michigan	50 000	1 250,000	25	3 00	June 1899	2,801 500	C.
70	Parrot	Montana	230 000	2 300,000	10	1 50	May 1899	2,800 898	C
71	Pennsylvania Consolidated	California	51,500	5,150 000	10	05	June 1899	67,100	
72	Pioneer	California	100,000	1,000 000	10	12½	Mar 1899	82 500	G.
73	Portland	Colorado	3,000.000	3,000 000	1	02	June 1899	2,197,080	G, S
74	Plumbago	California	300,000	300 000	1	15	Jan 1899	45 000	G.
75	Quicksilver Pref	California	43,000	4,300,000	100	50	May 1899	1,845,411	Q
76	Quicksilver Consolidated	California	57,000	5,700,000	100	40	July 1899	643,867	Q.
77	Quincy	Michigan	100 000	2,500,000	25	3 50	Feb 1899	10,470.000	C.
78	*Republic Consolidated	Washington	3,000 000	3,000,000	1	01	June 1899	183,000	G
79	Rambler Cariboo	British Col	1,000,000	1,000,000	1	01	April 1899	50,000	
80	Royal Consolidated	British Col.	2,500,000	2 500,000	1	01	Mar 1899	25 000	G.
81	Sacramento	Utah	1,000,000	5,000,000	5	00½	June 1899	87,500	G.
82	Small Hopes Consolidated	Colorado	250,000	5,000 000	20	10	Feb 1899	3,325 000	S.
83	South Swansea	Utah	150,000	150,000	1	05	Apr 1899	147 500	S, L.
84	Standard	Idaho	500,000	500,000	1	06	Apr 1899	1 745 000	G, S
85	Standard	California	200 000	20,000 000	100	10	May 1899	3 859, 25	G, S.
86	St. Joseph	Missouri	30 000	3,000 000	10	1 50	Mar 1899	2,822 000	L.
87	Silver King	Utah	150 000	3,000 000	20	25	May 1899	2,175,000	S, L, G
88	Smuggler	Colorado	1,000,000	1,000 000	1	01	June 1899	1 155,000	S, L, Z
89	Swansea	Utah	100 000	500 000	5	05	May 1899	151 500	S L.
90	Tamarack	Michigan	60 000	1,500,000	15	4 00	June 1899	5,910 000	C.
91	Tomboy	Colorado	200 000	2,000,000	10	4 00	May 1899	730 000	G.
92	Utah	Utah	100,000	1,000,000	10	02	Jan 1899	179 000	G
93	Vindicator	Colorado	1,500 000	1,500 000	1	05	Apr 1899	203,000	G
94	War Eagle	British Col	2.000,000	1,000,000	1	01½	May 1899	309 000	
95	Wolverine	Michigan	40 000	2,500,000	25	1 50	Apr 1899	150 000	C.
96	Yellow Aster	California	100,000	1,000,000	10	10	May 1899	203 789	G.

B. Silver; G. Gold; L. Lead; C. Copper; Q. Quicksilver; I. Iron Z. Zinc.

N B Companies not listed have not paid a dividend for the last twelve months.

*Paid since consolidation, $63,000; Republic paid $120,000 under old management.

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[illegible] 22, 1898.

[illegible]

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